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THE CORPS OF ENGINEERS' PLAN FOR THE DEVELOPMENT OF THE POTOMAC RIVER BASIN

Maryland. State Planning Dept.
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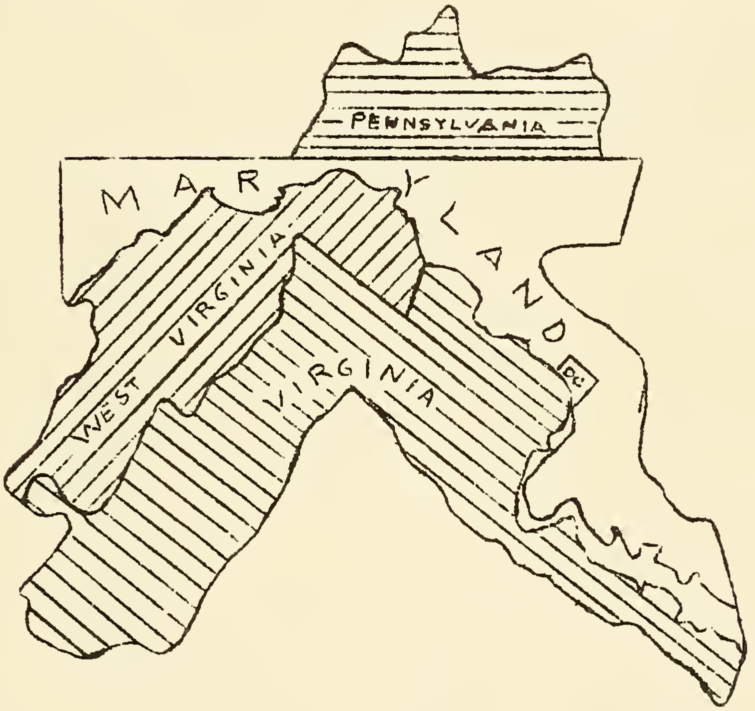

A REPORT TO THE GOVERNOR OF MARYLAND BY THE STATE PLANNING DEPARTMENT

AUGUST 1964

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THE CORPS OF ENGINEERS' PLAN FOR THE DEVELOPMENT OF THE POTOMAC RIVER BASIN

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THE CORPS OF ENGINEERS' PLAN FOR THE DEVELOPMENT OF THE POTOMAC RIVER BASIN

A REPORT TO THE GOVERNOR OF MARYLAND BY THE STATE PLANNING DEPARTMENT

The Corps of Engineers completed a report on the North Branch of the Potomac River in April, 1961. At that time, and in anticipation of a forthcoming comprehensive report on the entire Potomac, Governor Tawes directed the State Planning Department to coordinate the views of all concerned Maryland agencies in formulating recommendations with regard to the Corps' plan for the Basin.

This directive was carried out by a series of meetings with State agency representatives to discuss the proposed development for the Potomac. Written comments were received from the agencies after the comprehensive report was released and distributed to all concerned groups. Meetings with local officials and delegates to the General Assembly were also held for the purpose of obtaining first-hand local views respecting proposed projects. Progress reports were made periodically to the Governor and the Potomac River Committee of the Legislative Council. An inspection was made of all proposed project sites located in Maryland.

In addition to these activities, the State Planning Department has made a detailed evaluation of the Corps' proposals, particularly as they relate to Maryland. The following report and recommendations are the result of the coordinative activity and the studies of the Planning Department.

Summary of the Corps of Engineers' Report

The drainage area of the Potomac River is 14,670 square miles of which 5,723 are located in Virginia, 3,818 in Maryland, 3,490 in West Virginia, 1,570 in Pennsylvania, and 69 in the District of Columbia. The portion of the Basin located in Maryland comprises nearly 40 per cent of the State's total land area. The Potomac River and its tributaries currently serve the municipal, industrial, rural domestic and agricultural water needs of over 3.0 million people, including approximately a million Marylanders. The largest concentration of population is in the Washington Metropolitan Area with about 2.0 million persons. More than a third of the Metropolitan Area population are residents of Montgomery and Prince George's Counties in Maryland. Other concentrations of population are located in the North Branch area surrounding and upstream from Cumberland, Maryland, and in the Great Valley extending from Waynesboro, Virginia through Washington County in Maryland to Chambersburg, Pennsylvania.

For the past three decades, population in the Potomac Basin has grown faster than the national rate. It is estimated that this growth will continue over the next 50 years from 3 million in 1960 to nearly 5 million in 1985 and reach more than 7 million in 2010. The continued growth of population will result largely from expanded economic opportunities. Measured in terms of employment and personal income, the economy of the Basin will continue to grow at a rate somewhat higher than that of the Nation.

Meeting the water resource needs of the Basin in view of this projected growth is the subject of a study recently completed by the Corps of Engineers. The results of the study involving the collaborative efforts

of other Federal agencies are contained in the nine volume Potomac River Basin Report, hereafter referred to as the "Report." The Report has been submitted to the Governors of the several affected states for their review and comment.

According to the Report and based upon projections of population and economic activity, water supply requirements for municipal, industrial, rural domestic and agricultural use in the Potomac River Service Area are expected to increase from the present 1,290 millions of gallons per day to 4,280 millions of gallons per day by the year 2010. Water supply shortages, particularly in the Washington Metropolitan Area and the North Branch Area above Cumberland, are expected to occur prior to 1985. These deficiencies will be greatly accentuated by 2010.

The Report notes with emphasis the inseparability of water quantity and quality and the fact that increases in water quality requirements are certain to accompany anticipated growth in the Basin. Water of satisfactory quality is essential not only for meeting water supply requirements, but also for aesthetic appearance, the maintenance of aquatic life and recreational use. Under present conditions of water control and with even substantially higher levels of treatment than at present, the Potomac during periods of low flow will be able to assimilate only a part of the incremental waste load brought on by population and economic growth, according to the Report.

The characteristically wide range of fluctuation in the flow of the Potomac produces serious flood damage during periods of high flow. Major floods have occurred in various parts of the Basin, the most recent in 1955. Under the present degree of flood protection, damages are

expected to total $430 million during the next 50 years. Of this total, $65 million or $1.3 million annually is expected to occur in the North Branch Valley.

Because of a number of socio-economic factors, public participation in outdoor recreation is expected to increase substantially in the Basin area. Water is a focal point of outdoor recreation, and recreational activities will tend to be concentrated in areas within close proximity to water. The attraction of water-oriented recreation coupled with the increasing demand for recreation is assurance that any water-based development for public recreation will be utilized to the maximum extent that facilities are provided.

The Report concludes that in order to meet future water needs, development and control of the water resources of the Basin are essential.

Certain "risk" criteria were adopted by the Corps as requisite to an acceptable plan for water-resource development in the Basin. These are as follows:

1. For each potential damage area, there should be protection from a flood of a somewhat greater magnitude than the largest flood of record.
2. Stream flow allocated for water supply should be sufficient to meet nearly all requirements with deficiencies occurring not more than one to three days over a period of 30 years.
3. Required dependable flow for water quality purposes should be assured. The minimum acceptable risk, i.e. the toleration of a flow less than what is required, is a deficiency occurring for a one-week period on an average of once in ten years. (High levels of waste treatment are regarded as a necessary adjunct to low-flow augmentation. Accordingly,

80 and 85 per cent levels of treatment by 1985 and 2010, respectively, are anticipated for all but the Washington Metropolitan Area, where 85 and 90 per cent levels of treatment are expected.)

On the basis of these criteria, the Corps formulated four alternative proposals for the development of the Potomac River Basin, namely, an Main Stem and Upper Basin Plan, two Major Tributary Plans and an Upper Basin Plan. The four plans differed only with respect to the number and site location of the major reservoirs. Common to each of the plans, however, were 10 major reservoirs, 409 headwater reservoirs authorized under Public Law 566, and 3 local flood control projects authorized under Public Law 685, all projects for which could be found no suitable substitutes. In addition to satisfying the water supply and flood control requirements in local areas, the small headwater reservoirs would contribute to the needed flow increase of areas further downstream. The 10 major reservoirs in combination with the headwater reservoirs would satisfy the water needs of all the Basin outside the Washington Metropolitan Area. The four alternative plans therefore differed only with respect to the combinations of additional major reservoirs needed to satisfy the remaining flow requirement at the Washington Metropolitan Area and to provide added flood control protection.

While comparison of the alternatives disclosed that the Main Stem and Upper Basin Plan provided the highest monetary benefits in relation to cost, it also was found to have the greatest adverse effects because of families displaced, immediate tax losses and land inundated. In the belief that these adverse effects could be minimized by shifting the proposed dam site of the main stem reservoir at Riverbend to 4 miles upstream

near Seneca Creek, a modified version of the Main Stem and Upper Basin Plan was selected as the recommended plan. The modification involved also the addition of four major reservoirs and 9 small headwater reservoirs to compensate for the loss of storage resulting from a reduction in the size of the main stem reservoir.

The Corps' recommended plan, costing an estimated total of $498 million, comprises (1) 418 small headwater reservoirs for flood control, water supply, quality control and recreation; (2) 16 major reservoirs* (and 4 trunk sewers required in connection with 3 of the reservoir projects) for flood control, low flow augmentation and recreation; and (3) the 3 small flood-control projects previously authorized. The plan calls for the degrees of waste treatment discussed under "risk" criteria. (This point deserves special emphasis, i.e. that the recommended plan is not designed to be a substitute for adequate sewage and waste treatment.) The recommended plan provides also for the carrying out of land management and conservation measures to reduce soil erosion and rapid localized runoff.

The location and other relevant information regarding the proposed projects included in the recommended plan is summarized in the accompanying table.

According to the Report, the recommended plan would provide for all water supply and water quality control needs in the Basin to the year 2010, reduce flood damage by nearly two-thirds and provide recreational opportunities for approximately 16 million visitor days per year.

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* The original Main Stem and Upper Basin Plan consisted of 12 projects, of which 10 were common to each of the alternative plans. With the substitution of Seneca for Riverbend, 4 additional projects were added, making a total of 16.

CORPS OF ENGINEERS' RECOMMENDED PLAN
SUMMARY OF PROJECT DATA

Project	River	Scheduled Completion Date	Total Storage (Thousand Acre-Feet)	Project Area (Thousand Acres)	Project Cost (Thousands of Dollars)
MAJOR RESERVOIRS					
1. Bloomington*	No. Br. Potomac	1965	131.0	2.6	$ 51,062
2. Royal Glen	So. Br. Potomac	1968	320.0	10.5	32,517
3. Chambersburg	Conococheague Cr.	1969	29.0	3.1	13,353
4. Staunton	Middle River	1970	107.5	7.9	25,806
5. Six Bridge*	Monocacy River	1971	69.0	8.5	15,499
6. West Branch	W. Br. Conococheague	1972	46.0	8.0	13,839
7. Brocks Gap	N. Fk. Shenandoah	1973	122.0	10.0	18,160
8. Winchester	Opequon Creek	1974	29.3	3.8	12,092
9. Seneca*	Potomac River	1977	1010.0	58.1	116,934
10. Licking Creek*	Licking Creek	1987	82.5	5.9	13,304
11. Mount Storm	Stony River	1991	32.0	3.1	10,391
12. Town Creek*	Town Creek	1993	58.0	5.6	12,597
13. North Mountain	Back Creek, W. Va.	1997	97.5	9.7	19,788
14. Savage II*	Savage River	1998	39.5	0.9	13,460
15. Back Creek	Back Creek, Pa.	2002	20.7	3.9	8,854
16. Tonoloway Creek*	Tonoloway Creek	2007	50.5	5.7	15,507
SUB-TOTALS			2244.5	147.3	$393,341
HEADWATER RESERVOIRS**	Nunber				
Group I	50	1965	82.1	-)	
Group II	336	1985	936.9	-)	$104,755
Group III	32	2010	136.7	-)	
SUB-TOTALS	418		1155.7		$104,755
TOTALS			3400.2	147.3	$498,096

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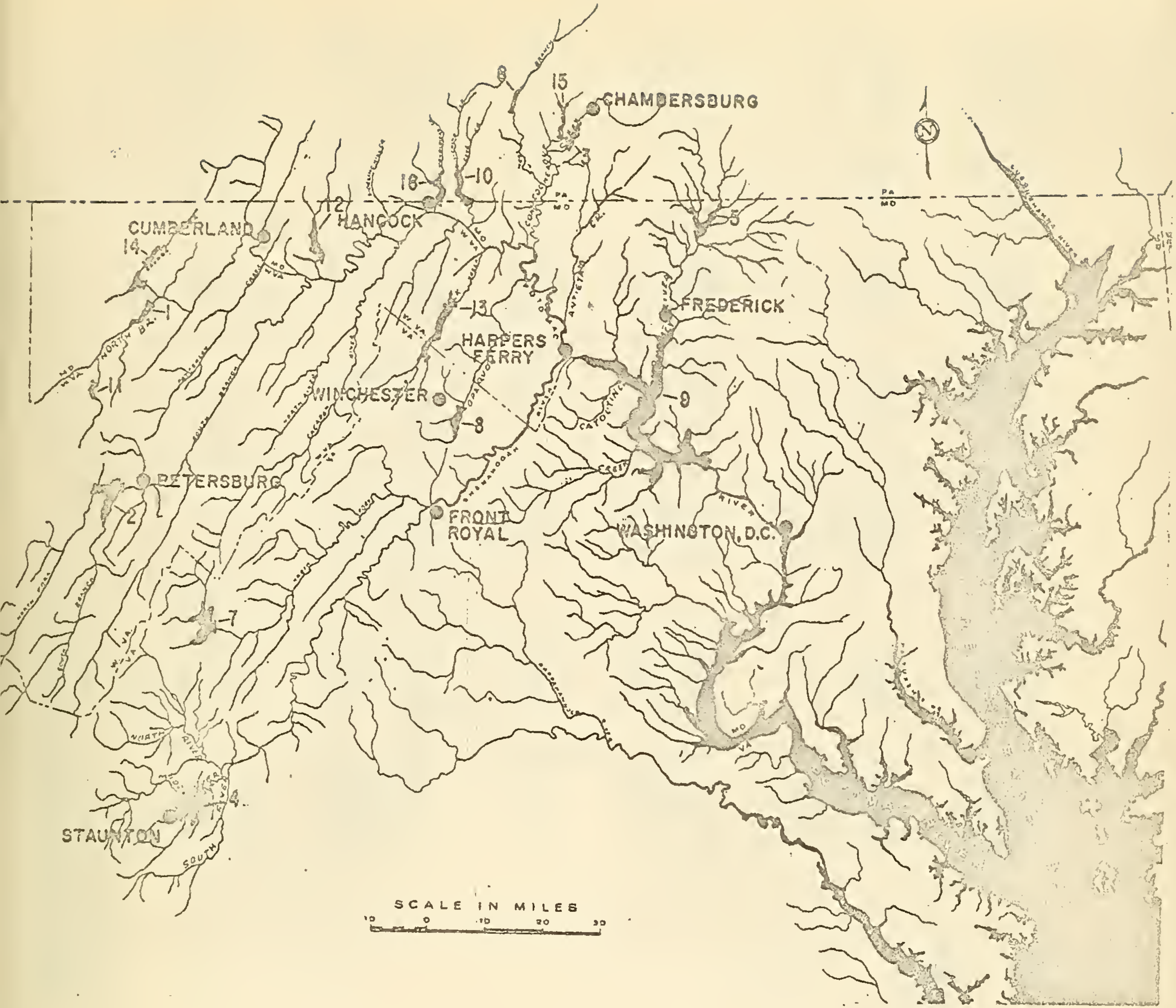
* Located totally or partially in Maryland.
** Grouped according to three scheduled dates for completion.



MAJOR RESERVOIRS IN CORPS' RECOMMENDED PLAN

Project	River	Project	River
1. Bloomington	No. Br. Potomac	9. Seneca	Potomac River
2. Royal Glen	So. Br. Potomac	10. Licking Creek	Licking Creek
3. Chambersburg	Conococheague Cr.	11. Mount Storm	Stony River
4. Staunton	Middle River	12. Town Creek	Town Creek
5. Six Bridge	Monocacy River	13. North Mountain	Back, W. Va.
6. West Branch	W. Br. Conococheague	14. Savage II	Savage River
7. Brocks Gap	N. Fk. Shenandoah	15. Back Creek	Back Creek, Pa.
8. Winchester	Opequon Creek	16. Tonoloway Creek	Tonoloway Creek

CORPS OF ENGINEERS' RECOMMENDED PLAN
MAJOR RESERVOIRS PROPOSED FOR CONSTRUCTION IN MARYLAND

Project	Bloomington	Six Bridge	Seneca	Licking Creek	Town Creek	Savage II	Tonoloway
River	North Branch	Monocacy R.	Potomac R.	Licking Creek	Town Creek	Savage River	Tonoloway Cr.
Scheduled Date of Completion	1965	1971	1977	1987	1993	1998	2007
Storage (acre-feet)							
Sediment	3,000	4,000	90,000	400	500	500	500
Low Flow Supplementation	92,000	65,000	460,000	82,100	57,500	39,000	50,000
Static Flood Control	36,000	-	460,000	-	-	-	-
Surcharge	6,500	34,000	183,000	38,000	38,800	10,500	37,500
TOTAL	137,500	103,000	1,193,000	120,500	96,800	50,000	88,000
Area (acres)							
Maximum Flood Pool	1,300	4,650	38,700	2,200	2,190	580	2,260
Full Conservation Pool	1,025	3,500	24,000	1,660	1,530	435	1,520
Minimum Pool	140	390	9,100	40	110	35	60
Real Estate (acres)							
Reservoir Operation and Construction	1,850	5,850	44,400	2,410	3,000	840	2,710
Additional Land for Recreation	730	2,650	13,700	3,460	2,580	50	3,030
Replacement of Wildlife Habitat	790	2,380	13,120	1,270	1,300	350	1,160
TOTAL	3,370	10,880	71,220	7,140	6,880	1,290	6,900
Allocation of Initial Construction Cost ($000)							
Water Supply	14,047	988	15,839	2,275	1,565	7,690	2,594
Quality Control	22,630	6,443	47,516	5,040	3,051	3,997	4,435
Flood Control	12,649	-	9,561	-	-	-	-
Recreation	1,336	6,943	28,873	3,986	5,146	1,449	6,787
TOTAL	50,662	14,374	101,789	11,301	9,762	13,136	13,816
Apportionment of Initial Construction Cost ($000)							
Federal	36,615	13,386	85,950	9,026	7,066	5,446	9,689
Non-Federal	14,047	988	15,839	2,275	2,696	7,690	4,127
TOTAL	50,662	14,374	101,789	11,301	9,762	13,136	13,816

CORPS OF ENGINEERS' RECOMMENDED PLAN

HEADWATER RESERVOIRS PROPOSED FOR CONSTRUCTION IN MARYLAND

SUBWATERSHED Name	SUBWATERSHED Number	Site Number	Purpose	Drainage Area (Sq. Mi.)	Total Storage (Ac. Ft.)	Perm. Pool Area (Acres)	Location By County
Gilbert Run	74	22A	F[1]	8.18	3370	77	Charles
		26	F	2.68	1100	23	
		30A	F	4.30	1555	40	
St. Mary's River	71	4	F	2.5	533	14	St. Mary's
		5	F	6.8	1450	61	
		6	F	8.2	1748	53	
		70	F	2.7	576	20	
Rock Creek	69	13	M_{fr}[3]	12.77	4359	74	Montgomery
		14	M_{fr}	12.23	4228	54	
Seneca Creek	68	19	F	3.1	661	17	Montgomery
		20	F	3.0	640	13	
		21	F	4.8	1023	17	
		23	F	4.3	917	19	
		25	F	7.7	1642	28	
		28	F	3.5	746	12	
		29	F	2.5	533	8	
		31	F	3.3	704	11	
		33	F	3.9	831	14	
		35	F	10.1	2153	22	
Big Pipe Creek	53	7	M_{fw}[4]	7.9	6062	45	Carroll
		12	M_{fw}	5.1	2252	61	
		17	F	3.5	746	11	
		19	F	15.8	3368	12	
		24	W[2]	5.4	2844	122	
		28	M_{fw}	3.8	3181	120	
		28A	F	2.8	597	10	
		31A	M_{fw}	10.7	8981	450	
		45	F	2.6	554	11	

HEADWATER RESERVOIRS PROPOSED FOR CONSTRUCTION IN MARYLAND (CONT'D)

SUBWATERSHED Name	SUBWATERSHED Number	Site Number	Purpose	Drainage Area (Sq. Mi.)	Total Storage (Ac. Ft.)	Perm. Pool Area (Acres)	Location By County
Big Pipe Creek (Cont'd)	53	46A	M_{fw}	10.6	10,812	450	
		49	W	1.2	968	76	
		52A	F	8.4	1791	33	
		54	M_{fw}	2.4	2453	121	
		55	F	3.7	789	21	
Upper Monocacy*	52	3	M_{fw}	1.6	1631	25	Frederick
		4	M_{fw}	5.8	2932	93	
Tom Creek	51	6	F	13.6	2900	21	Frederick
Middle Monocacy	50	24	W	3.5	2823	150	Frederick
		30	W	8.3	6690	144	
Antietam Creek	42	26	W	2.9	1637	125	Washington
		27	W	4.7	2945	140	
		32	W	14.7	9212	521	
Town Creek	15	3	W	21.8	9302	257	Allegany
North Branch Potomac	3	41	F	4.1	874	10	Garrett

Notes:

* Rock Creek and Marsh Creek
1/ F -- Flood Prevention
2/ W -- Water Supply
3/ M_{fr} -- Multi-purpose (Flood Prevention and Recreation)
4/ M_{fw} -- Multi-purpose (Flood Prevention and Water Supply)

An Assessment of the Corps' Plan with Respect to Maryland Water Requirements

The following section is a discussion of water-resource needs in the Maryland portion of the Basin and the impact of the Corps' plan in respect to these requirements. For convenience, the Basin drainage area in Maryland is divided into five segments.

1. Washington Metropolitan Area and Estuary
2. North Branch sub-basin
3. Town, Sideling Hill, Tonoloway and Licking Creek sub-basins
4. Conococheague and Antietam Creek sub-basins
5. Monocacy River and Catoctin Creek sub-basins

Because of the general discussion with reference to the total plan contained therein, the Washington Metropolitan Area is the first section covered. The evaluation then moves to the upper-most stretch of the Potomac (i.e. North Branch) and thereafter continues downstream.

Following the discussion of each sub-basin, a summary of comments received from State and local government agencies is presented. The complete letters received by the State Planning Department in carrying out its coordinative function are included in the Appendices.

Washington Metropolitan Area and Estuary

A generally overlooked fact in discussing the water problems of the Washington Metropolitan Area, is the significant portion of the region's population outside of the Federal city, the District of Columbia. At

present, the Maryland segment of the Metropolitan Area contains nearly 35% of the 1,933,000 total population and is expected to account for nearly 50% of the five million population projected for the year 2010. Moreover, Maryland's concern for the future development and accompanying problems in the lower Potomac does not end at the D. C. line since the Potomac estuary borders and embraces significant portions of Prince George's, Charles and St. Mary's Counties.

Federal operations in D. C. comprise the major economic activity in the area. With very little industry present, the major withdrawal use of water is for domestic purposes. Domestic requirements are expected to increase considerably in the suburban areas of Maryland and Virginia where a large percentage of those earning their livelihood in D. C. will be residing.

Based on the low-flow criteria used by the Corps of Engineers, a deficit in the Metropolitan Area's water supply is anticipated before 1985 with rationing of water necessary during periods of peak withdrawal after 1977. (Appendix A to this report contains comments from other authorities who generally substantiate this information.) At this time, all surface sources except the Potomac will be completely utilized. Of the alternatives suggested for meeting water requirements, either in total or in part, ground water and proposals for distillation of waste waters probably warrant the closest examination.

Although an abundant supply of ground water exists in the Metropolitan Area, its development as a supplementary source would not compete favorably in cost with surface water because of the number of wells that would have to be constructed and operated, and the miles of pipeline that

would be required. The available ground water can and should be reserved for development in small local units for municipal and industrial purposes. The ground water may be the only source available to such communities, and heavy pumping by the Washington Metropolitan Area would deprive them of the only source of supply practical for their development.

The distillation of sewage as a water supply for the D. C. Metropolitan Area is not economically feasible at this time. Major problems still to be resolved relate to 1) reducing fuel costs; 2) "flash over" of volatile organics; 3) affects of thermal pollution and its relationship to productivity in the estuary; and 4) the disposal of concentrated wastes. A recent evaluation of alternative means for providing additional water to the D. C. area indicated the following:

System	Construction Costs	Total Annual Cost
	(millions of dollars)	
Distillation	210.5	22.4 - 26.4*
Flow Augmentation	115.9	5.4

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* not including the costs of pumping away the residual waste

Source - Davis, Robert K. "Water Supply Economics in the Potomac River Basin," Journal of American Waterworks Association. March, 1964. Vol. 56, pp. 257-266.

In his evaluation, Mr. Davis accepted the construction costs for a distillation plant as presented by Mr. A. W. Smith in his report Analysis of the Potomac River Basin Report, National Parks Association, Washington, D. C. (1963).

This analysis and other material evaluated during the review of the Potomac Report clearly indicate that distillation cannot provide water at a cost which would be competitive with the development of surface supplies at present.

The Potomac estuary receives waste loadings in both untreated form and as effluent form upstream. The estuary is capable of assimilating a portion of this load through natural biological processes; this capacity, however, has already been exceeded. Increasing treatment to a maximum level economically feasible would improve the situation, but a substantial residual would still remain to be assimilated by natural processes. Unlike the situation in running streams, increasing the assimilatory capacity of an estuary by augmenting flows is complicated by the effect of tides. The Corps' Report recommends a program including higher levels of treatment and low-flow augmentation for improving quality in the estuary. Question has been raised as to whether these means will be adequate. The problem of water-quality control in the Potomac estuary is one deserving further consideration.

The Seneca project is the only dam proposed for construction within the Washington Metropolitan Area. It is also the only project in the Corps' plan recommended for construction on the main stem of the Potomac. Proposed upstream tributary projects, however, must be considered along with Seneca in assessing the Metropolitan situation by reason of their effect on stream flow in the main stem. Whatever local benefits might be served by these projects, they still are a part of a development system which either directly or indirectly results in a greater stream flow passing through the Metropolitan Area and entering the estuary.

At this stage of assessing the water situation in the D. C. area, a basic assumption reached after reviewing and evaluating available data must be stated. This assumption which is valid for the present time period and under existing technology is that any significant amount of water required for the D. C. region must be provided by storage upstream from

the area of use. If more water is needed, then a system of storage either along the lines of that recommended by the Corps or some modification thereof must serve an integral role in a comprehensive development plan for the D. C. region and the entire Potomac Basin.

From the Maryland viewpoint and more particularly the Washington region, the Corps' recommended program varies in only one major respect from the alternative storage systems suggested: the recommended plan includes a reservoir at Seneca; none of the alternatives include a project at Seneca and two of the three modified plans include a reservoir entirely in Maryland on Sideling Hill Creek. In respect to the Metropolitan Area, the recommended plan and its alternatives will provide the same low-flow augmentation benefits and are supposed to satisfy the water supply and quality needs until the year 2010. The systems of flow regulations, both the recommended plan and the alternatives, are premised on and must be accompanied by recommended degrees of sewage treatment.

The recommended plan which includes a project at Seneca has several advantages over its alternatives. These advantages are largely a result of the Seneca project proposed to be constructed immediately upstream from the area of need, namely the D. C. Metropolitan Area. The main-stem reservoir would provide the greatest degree of control of both low flow and flood flow for the Metropolitan Area since it would be located nearest the point of need. Seneca would also provide a large water-oriented recreation facility within close proximity of a heavily populated area. At the same time, the project would create the most severe relocation and displacement problems of any proposed development in the Basin. It would inundate many acres of good agriculture land (although some sizeable portion of this

acreage is expected to be removed from production due to suburbanization and other factors). And it would preclude the reconstruction and development of the historic C & O Canal in the flooded area.

Although the Corps' recommended plan provides a more flexible operating system, any of the alternative programs can meet the water supply needs of the D. C. area. There is no firm evidence, however, that the recommended plan or its alternatives is capable of correcting the water-quality situation in the estuary because of the effect of tides on water movement controlling the dispersal and assimilation of waste loadings. Because of this uncertainty, the Corps of Engineers has been requested to restudy the estuarine problem and the means of obtaining a desirable water quality. The request was particularly directed to the Seneca project because its operation is to provide over half of the flow required for water-quality control in the estuary.

Until the effect of increased stream flow on water quality in the estuary is known, a firm position by the State cannot be taken on either Seneca or that segment of the upstream program providing storage for quality control below Washington. In postponing this decision, the evaluation of low-flow augmentation benefits to be provided by the remaining upstream projects must be limited to the meeting of water-supply needs in the Metropolitan Area and to the satisfying of other water supply and quality requirements upstream from the Metropolitan Area. Consideration of recreation potential in the upstream program, on the other hand, can and must take into account the demands of the large and ever-growing Metropolitan Area.

A small watershed program proposed for the area includes 19 impoundments. Except for the two projects in the Rock Creek sub-watershed which have water storage to be used for recreation, the program is devoted exclusively to flood prevention. Several of the projects have already been approved by the local and State Soil Conservation Committees. Summary data on the program are as follows:

Sub-Watershed	No. of Projects	Drainage Area (acres)	Flood Prevention Storage (acre-feet)
Seneca Creek	10	46.2	8,616
Rock Creek	2	25.0	4,790
St. Marys River	4	20.2	3,767
Zekiah Swamp - Gilbert Run	3	15.2	5,122

Summary of Comments - State Agencies

State Health Department:

Relief in the Washington area is indicated in the near future because of the increasing demands due to the growth in population and the greater per capita use of water. In order to meet this need, time may not permit the building of numerous storage reservoirs on the headwaters of various major tributaries with varying rates of release to upgrade the low flows in the Potomac. In the absence of the Riverbend project, a major project further upstream appears necessary. The Seneca project would appear a good alternative. It could supply Washington and adjacent areas with adequate raw water for domestic uses and provide additional stream flow to assist in assimilating sewage and other wastes from Washington and nearby areas.

To what extent the additional flow is necessary to avoid degrading the chemical and possibly the bacteriological quality of the estuary of the river downstream from Washington is a matter of judgment tempered with calculations involving some unknown variables. A comprehensive program of chemical sampling of the river below Washington should be initiated and continued in the future without interruption. The present program of sampling, downstream a short distance below Washington, should be extended well into the estuary.

It is well established that the bacteriological quality of the estuary water, particularly in the area of the natural oyster areas, has not been degraded to the point of restricting the taking of oysters. Such information is available from the year 1926 to date. What the increased organic

load from the Washington area will bring about in the future must await analytical results progressively developed as time marches on.

Regardless of the need to provide additional flow in the estuary, the need for potable water in the metropolitan area around Washington will increase greatly during the next 40 years. The Washington Suburban Sanitary Commission which is now using about 22 mgd of Potomac River water estimates its needs for the year 2000 at 135 mgd. This requirement plus the additional needs of Washington and flow increases in the estuary would all point to the immediate need for construction of the Seneca project.

Maryland Geological Survey:

Although Appendix 6 of the Corps' Report gives a general summary of the ground water resources which are present in the Potomac Basin according to our present state of information, I /Dr. Kenneth N. Weaver/ cannot find any place in the major part of the Report where this source of supply is worked into the general scheme of the project. It appears from the statements on page 62, Volume 1, that this source has been dismissed because of various quality problems. It should be noted, however, that ground water can certainly act as a supplementary supply and can therefore free more surface water for low flow augmentation etc. In the recent past there have been several large self-contained communities started on the Coastal Plain (Levittown - Belair and Crofton) which are using and will use ground water exclusively and in large quantities (up to 3 million gallons per day for one development). There will probably be other such satellite communities developed on the Coastal Plain in the Washington Metropolitan Area and ground water may prove the most economical source of supply thereby reducing the continuously rising demand on surface water.

I agree with the recommendation of the Board of Engineers for Rivers and Harbors (p. 24) "That prior to the construction stage for the Seneca project detailed analyses be made of the complex water quality and tidal phenomena of the Potomac estuary, to determine whether the project is still the best overall means of fulfilling all of the water resources needs ...".

Only two test holes have been drilled at the Seneca site and both of these are on the Virginia side of the river. The inadequacy of this subsurface investigation has been recognized in the text but it still appears that even a tentative location of the major reservoir in the system should be supported by more geologic subsurface foundation data.

Game and Inland Fish Commission:

It is believed that development of the surface water reservoirs of the Potomac River Basin can be accomplished without the necessity of building any major main stem reservoirs. Should the Corps' recommended plan be implemented, the following comment will be pertinent to the proposed project concerned.

It would be preferable that the Seneca site be eliminated due to the high loss of natural scenic beauty, historic factors and very valuable residential and agricultural lands. The extremely wide fluctuation of water levels will undoubtedly replace a beautiful portion of the State with unsitely mudflats and barren reservoir sides. However, it could afford a great deal of recreational value provided water levels are properly managed and public access is assured.

Department of Water Resources:

It is true that advanced technology to date indicated that the most economic and feasible method for supplying sustained quantity of good quality water in a river basin such as the Potomac River Basin is the installation of a carefully planned system of reservoirs ... Since the water quality benefits in each of the plans are the same, the [Department] would be inclined to support the plan that will afford the greatest amount of the other benefits that will be derived at the lowest cost and with the least number of sacrifices. It is my opinion [Paul W. McKee, Director] that the first proposed plan in the report, mainly the Main Stem and Upper Basin Plan, will best meet these requirements.

In considering the Corps' plan, the [Department] wishes to stress the importance of the necessity for requiring adequate treatment for all discharges to the Potomac Basin. The [Department] wishes to emphasize that the recommended plan is not designed to be a substitute for adequate sewage and waste treatment.

The [Department] concurs with the plan requirement of 80-85% pollution removal by waste treatment in the Upper Basin areas and 90% removal in the Washington Metropolitan Area prior to the construction of storage capacity for water quality. More stringent requirements than those set by the plan might be desirable in instances, but would need to be compatible with the legislative act that governs the [Department] and its authority to require remedial facilities.

It is recognized that in free flowing streams, flow augmentation can be used successfully to maintain desired levels of water quality beyond that degree possible through use of the adequate waste treatment alone. It is also recognized that within certain stream reaches in the basin, such flow augmentation will be necessary and desirable in the immediate future if water quality objectives are to be realized under conditions of recorded dependable flow.

State Soil Conservation Committee:

In general, the Soil Conservation District Boards of Supervisors favor the upstream storage of water in reservoirs or small headwater structures. The District Supervisors do not oppose large dams and recommends that some sacrifice may have to be made in order to obtain the greater public benefit. The Montgomery District is concerned over the impact of a large dam below the mouth of the Seneca. Concern has been registered over the

inundation of farm lands by the dam on the Potomac at Seneca and the dam on the Monocacy. In the plans for the development of the Potomac River Basin, over 400 small upstream watershed impoundments are recommended by the Corps of Engineers. Plans for five of these structures are in the Gilbert Run and Licking Creek watershed projects.

Department of Forests and Parks:

This project will have a definite effect on Seneca State Park since it will flood much of the proposed take between Maryland Route 118 and the Potomac River. Proposed plans of operation would leave much of this area as mudflat during the summer months. The development of the proposed lake on the State park area would be outside the area flooded and would provide the needed water areas now.

Department of Chesapeake Bay Affairs:

From the standpoint of the Department, the following are the essential criteria: 1) reduction of sediment load carried into the Potomac estuary; and 2) delivery of the most uniform obtainable flow of water below Little Falls. Therefore, it appears that the Seneca and Monocacy River projects are of primary interest to us and we hope that these will have high priority in the schedule of construction.

Summary of Comments - Local and Other Governmental Agencies

Frederick County Planning and Zoning Commission:

As the primary purpose of the Corps' program is to help the District of Columbia solve its water and sewage problems, Frederick County should not be called upon to pay anything for the construction or maintenance of dams at Six Bridge or at Seneca. Also, the loss of taxes and the value of real estate taken for the projects should be reimbursed to the County.

One of the three or four plans in the early stages of the study included a high dam near Seneca and included more dams upstream and on the tributaries of the Potomac. These plans would be far less damaging than a plan including a dam at Seneca or Riverbend on the Potomac.

Washington County Economic Development Commission:

The Washington County Economic Development Commission favors a program for the Potomac River Basin which would result in the development of tributary and headwater dams with the objective of maintaining a reasonable constant flow along the entire course of the river. This program should be given top priority and the river dam at Seneca should not be constructed until this program is completed and the results of upstream construction evaluated properly.

Potomac Interstate Commission:

This Commission recognizes that in free flowing stream flow, augmentation can be used successfully to maintain desired levels of water quality beyond that degree possible through use of the "highest physically and economically practicable waste treatment." It also recognizes that within certain stream reaches in the basin such flow augmentation will be necessary in the near future as water quality objectives are to be realized under conditions of recorded dependable flow.

The Commission is unable to locate research data establishing that water which might be released from the proposed Seneca reservoir would sufficiently affect the quality of the river below the reservoir to justify the cost of storage for water quality control. In view of the complex nature of the Potomac estuary and the shortage of basic data concerning it, the Commission believes that additional information is necessary to support the high cost of improvement of conditions therein, and that the Corps should review fully in the light of then existing knowledge alternative means of establishing water quality objectives in the estuary.

National Capital Park and Planning Commission:

The complex nature of the Potomac estuary should be further studied because of the present uncertainty over the effectiveness of water released from this upper basin impoundment to control water quality in the upper tidal estuary of the Washington Metropolitan Area.

The scheduled completion date for the Seneca Project is 1977, at which time it is expected that water rationing practices would be required during periods of low flow. It is possible that rapid technological advances could, in the interim period, alter this plan in some, or in many respects. If, toward the end of this 13-year period, the proposed dam at Seneca is still considered the best possible solution, the concerned jurisdictions have no other recourse but to recommend implementation of the Engineer's plan. Therefore, the plan should be given this qualified approval and Seneca along with some, and possibly all, of the likely dam sites should be placed under some form of control so they may be preserved for the time of future need. Existing two acre zoning should provide the necessary protection.

The recreational potential resulting from this project, if and when it comes, would be of considerable significance and concern to Montgomery County. Based on the experience in other communities, it would seem adivsable, if not absolutely necessary, to protect the public interest and investment by making certain that all lands at a considerable distance inland from any future shoreline be in public ownership.

Washington Suburban Sanitary Commission:

After the year 2000 it is expected that the additional water supply requirements for the area of necessity will have to be obtained from the Potomac River.

Taking together the domestic water requirements of the Washington Suburban Sanitary District, the District of Columbia and Virginia it is clearly obvious that impoundment of the river will be necessary in the near future. Moreover, not only must the domestic water requirements of the area be met but also sufficient reservoir storage must be provided to control pollution and flood flows.

If the water quality of the lower estuary is to be maintained at a level commensurate with the desired scenic and recreational uses of the river, then low-flow augmentation through upstream reservoirs is an absolute necessity.

It is the recommendation of this Commission that the Corps of Engineers undertake multiple-purpose development of the Potomac River, including the construction of the necessary reservoirs, in the most economical manner.

Montgomery County Council:

The Council is opposed to any high-level dam project in the area of the Potomac River which would affect Montgomery County.

North Branch Sub-basin

The North Branch drainage area, one of the larger Potomac sub-basins, includes nearly all of Allegany County and a portion of Garrett County in Maryland. According to the Corps' Report, the 1962 population of 130,000 in the North Branch area is expected to increase 43% by 1985 and 106% by the year 2010 at which time a total population of 269,000 people will be living in the sub-basin. The projections also indicate that nearly half of the 2010 population will be in the Cumberland area. Owing to the characteristics and abundance of raw materials in the region, extensive industrial development has already taken place. Sufficient potential reserves are available to support even greater development in the future.

Primary-type industries dependent upon utilization of natural resources are characteristically classified as heavy water users. In view of industry's resource orientation in this area, the availability of water in sufficient quantity and acceptable quality becomes an important economic consideration. Domestic water requirements are intimately related to the industrial activity by reason of the fact that employment opportunities will determine the growth or decline of a region's population. The significance of water to the North Branch economy is an obvious one - water is probably more of a limiting factor to economic expansion in the North Branch area than in any other Maryland area within the Potomac Basin.

Present demands for water in the North Branch area are already taxing heavily the available supply, particularly in the Cumberland and Luke areas. Cumberland's municipal supply, which serves many of the local industries as well as its domestic requirements, can only meet its needs adequately until 1980 with serious problems expected during periods of heavy withdrawal after 1970. Industrial demands at Luke already exceed the dependable supply. In addition to these withdrawal uses, supplemental water is needed for the maintaining of stream-quality objectives. Augmented flow used in achieving desired standards of quality in no way diminishes the need for adequate sewage treatment. There is definite need for increased treatment capacity and efficiency at all waste sources. Also industry must expand in-plant recovery systems in proportion to production increases. No known practical conventional waste-treatment method, by itself, exists, however, which will provide a form of waste treatment comparable to that obtainable with conventional treatment supplemented by increased stream flow for control of dissolved oxygen, color, and persistent waste substances.

The table below approximates the projected water requirements in three stretches of the North Branch.

Area	Design Min. Flow (cfs)	1960 Requirements (cfs) Industry			1985 Requirements (cfs) Industry			2010 Requirements (cfs) Industry		
		Industry	Municipal	Quality Control	Industry	Municipal	Quality Control	Industry	Municipal	Quality Control
Luke	100	115	5	15	220	10	40	340	13	62
Cumberland	28	-	17	-	-	30	-	-	54	-
Cresaptown	100	60	-	-	100	-	-	135	-	-

The figures used here are extracted from the Public Health Service Appendix to the Corps' Report. Other estimates show a comparable deficit between supply and demand over the next 50 years.

Two North Branch projects, Bloomington and Savage II, are recommended for construction in Maryland. Bloomington has already been authorized with advanced planning studies presently being made. A third North Branch project, Mt. Storm, is in the West Virginia portion of the sub-basin.

The authorized Bloomington project will provide for the industrial and water-quality control demands in the North Branch, thus allowing the higher-quality water in the existing Savage River Reservoir to be used for municipal needs throughout the sub-basin. The augmented flow of the stream, combined with the recommended treatment, will maintain a stream quality adequate for projected uses of the North Branch. The supplemented low flow also will benefit downstream Maryland residents and industries. Recreation potential of the area, certainly a secondary purpose in this instance, will nevertheless be improved to the extent that over a thousand surface acres of water will be available for recreational use.

In addition to reducing flood losses, the protection afforded by Bloomington will encourage the development of potentially good industrial sites not being used at present because of their periodic inundation.

Under the Corps' plan, Savage II is not scheduled for construction until the 1990's at which time, the demand for additional water will exceed the capacity of prior development (i.e. Bloomington, Mt. Storm). Because of its good quality, water from Savage II should probably be allocated entirely for municipal purposes which include domestic and certain specialized industrial uses requiring water of high quality. While the municipal uses would be of primary importance, water-quality benefits in the North Branch and further downstream would also be realized. The increased flow will be particularly useful in the dilution of acid mine wastes draining into the North Branch.

Of the three sites proposed for the North Branch, Savage II would be most advantageous in enhancing the area's recreation opportunities. In addition to providing nearly 500 acres of water surface, Savage II would be operated so as to maximize the potential recreational opportunity downstream on the larger Savage Reservoir now in existence. The existing reservoir unquestionably would be the greater attraction to recreationists; it could become one of the outstanding recreational facilities in Western Maryland if its pool elevation were maintained at a more stable level during the summer season by the upstream construction and water-release operations of Savage II.

Irrespective of the Corps' benefit-cost ratio calculations which are used in determining the time of construction, some consideration must be given to advancing the construction data of Savage II. As stated

previously, Cumberland is expected to face water supply problems long before the 1990 proposed construction date. Cumberland's present source, Evitts Creek, is barely adequate to meet existing demands much less to support additional growth in the area. A 1961 study (Matz, Childs and Associates, Inc., The Savage River Water Transmission Main - A Proposed Development of the Savage River as a Source of Water Supply for Western Maryland) indicated that there was no feasible means of increasing the dependable yield of Evitts Creek. Other adjacent streams except the Savage River (i.e. Wills Creek, Town Creek) are eliminated also as possible sources because of the relatively high development costs. After a rather convincing statistical analysis verifying the need for an additional water supply at the earliest possible time, the report recommends the development of the Savage River as a potable water supply source for the entire western area of Allegany County. The proposed Savage River Service Area would service over 92% of the 1960 population in Allegany County.

In addition to meeting domestic demands, the availability of additional supply from the Savage River will offer an immediate inducement to industries requiring a source of high-quality water. The proposed transmission line transverses adjacent to or through the greater portion of the potentially developable industrial land in the western section of Allegany County. Also, the increased recreation potential that will be provided by Savage II cannot be overlooked by the State of Maryland. Since the only non-Federal project costs relate to water supply, the State would have an additional recreational facility as well as the improvement of an existing one at a cost far less than any alternative development constructed for single-purpose recreational use.

The location of both North Branch sites in Maryland are such that relatively little economic loss is involved. Relocating 6.7 miles of Western Maryland Railway at the Bloomington site is the major item in this respect. This relocation, costing $12,000,000, is a project cost and is allocated among the project purposes.

Summary of Comments - State Agencies

State Health Department:

Of all the projects planned for the Potomac River Basin, the development of a source of satisfactory raw water for municipal water supply in Allegany County is of primary health importance in Maryland. The need for additional water in the upper reaches of the basin, in order to provide for industrial growth and the assimilation of domestic sewage and industrial wastes, is also of major importance for the economy of the area and the health of the residents. This may be accomplished by building a dual purpose reservoir on the North Branch to elevate low flows in the river and to compensate for raw water to be withdrawn from the present Savage River Dam, supplemented in the future by a second reservoir on the Savage. The waters of the Savage River have a lower acid mine waste content than those of the Potomac, and therefore, are more desirable as a source of raw water supply.

Cumberland has about reached its economical limit in the storing of desirable raw water. Evitts Creek is impounded to its economical and yield limits. Except for raw water, taken from the Potomac River, Cumberland would need to impound Wills Creek, which is not a desirable source, or possibly Town Creek. Either development would be very expensive. Also storage would need be made in the Pennsylvania area of these streams and it may or may not be possible to negotiate such arrangements. Adjacent and other nearby growing areas are progressively depending upon Cumberland to supply them with water. Possibly the end point has already been reached in serving new areas until a supply from the North Branch can be secured.

The population now served by Cumberland is estimated to be 50,000. It is anticipated that Cumberland, and the area along the Potomac River to Westernport, will have a population of 70,000 by the year 2000. An estimate prepared by independent consultants agrees substantially with U. S. Army Corps of Engineers and indicates that the raw water needs for this area will increase from the 14 mgd of finished water now furnished by Cumberland to 31 mgd during the next 40 years. Of this latter amount 10 mgd would be required for residential and commercial properties and 21 mgd for industrial use.

A number of the communities in the Georges Creek Valley, from above Westernport up to Frostburg, are desperately in need of an adequate and satisfactory source of raw water. Westernport is currently served by the Savage River Dam and Luke and the West Virginia Pulp and Paper Company draws on the Potomac for raw water. The future needs of this section, exclusive of Westernport and Luke, which were included in the figures previously given, are 2 mgd for residential use and 2 mgd for industrial purposes.

As low flows in the river are elevated due to increased reservoir capacity on the North Branch and the Savage River, additional industry will probably be attracted to the desirable industrial sites along the Potomac between Cumberland and Westernport. This in turn will involve greater re-use of the river water, even with the increased flows. These additional uses would indicate a continuing need to re-evaluate the total water requirements and to determine water quality throughout the area. Additional treatment of domestic and industrial wastes could then be prescribed as needed to meet the water standards required for safe future growth. This information would also help determine the excess storage, for water supply, that should be built into a second Savage River or Stony River impoundment.

Game and Inland Fish Commission:

It is believed that development of the surface water resources of the Potomac Basin can be accomplished without the necessity of building any major main stem reservoirs. Should the Corps' recommended plan be implemented, the following comments would be pertinent to each of the projects concerned.

1) Savage River II - This impoundment would result in the least loss of wildlife lands, yet return a fair amount of fishing opportunity.

2) Bloomington - This impoundment represents only modest fishing potential and is located relatively close to Deep Creek Lake. Wildlife loss would also be relatively low.

Department of Water Resources:

There is no known objection in the State of Maryland to the construction of the Bloomington project. Its construction would be a beneficial economic effect on Western Maryland in addition to its long-range effect on flood control.

State Soil Conservation Committee:

In general, the Soil Conservation District Boards of Supervisors favor the upstream storage of water in reservoirs or small headwater structures. The District Supervisors do not oppose large dams and recognize that some sacrifice may have to be made in order to obtain the greater public benefit. Neither Bloomington nor Savage II will remove much land from the agriculture in Maryland.

Department of Forests and Parks:

Bloomington - The recreational use of this reservoir will all be based on the Maryland side of the river. If, as is many times the case, the Corps of Engineers' plans include operation of the recreational facilities of the State, presumably forests and parks, enough land should be acquired, by State action if necessary, to insure adequate room for operation and protection. This reservoir can well ease the burden of water recreation, which in the case of recreational boating is rapidly reaching the saturation point at Deep Creek Lake. Camping, boating and other water-based activities should be highly developed.

Savage - The proposed operating plan for this reservoir will make Savage I more attractive and its development for recreation more feasible by maintaining water levels there. The Savage I area can become a major recreational development.

Summary of Comments - Local and Other Governmental Agencies

Garrett County:

The undersigned elected officials are unanimously in favor of the Bloomington project. The many advantages of the construction of this dam to be afforded this area are too apparent to be repeated here. The elected officials request that every consideration be given for the utilization of local employment in the construction of the dam since chronic unemployment is one of the economic ills of Garrett County. There will be some discussion necessary between the elected officials of Garrett County and the administrative force handling this project concerning some of the mechanics of the projects, such as replacing existing roads, etc. (Spencer Graham, State Senator; Elza E. Bray, Member, House of Delegates; Elwood S. Groves, Member, House of Delegates; Martha I. Glotfelty, Member, House of Delegates; Allen S. Paugh, President, Board of County Commissioners; H. D. Swartzentruber, Member, Board of County Commissioners and Earl E. Opel, Member, Board of County Commissioners.)

Town, Sideling Hill, Tonoloway and Licking Creek Sub-basins

The total watershed area of these four sub-basins is 588 square miles of which 119 square miles are located in Allegany and Washington Counties of Maryland. Town Creek, Sideling Hill Creek, Tonoloway Creek, and Licking Creek enter the Potomac River at river mileages above Washington, D. C.

of 172, 141, 127 and 121 miles, respectively. The population in the Maryland portion of the area is approximately 10,000 with Hancock in Washington County the largest urban center (population 2,000).* Economic activity in the four valleys is largely restricted to agriculture, primarily beef and dairy husbandry. In the Hancock area, there is extensive acreage in orchards.

Water requirements in the region are comparatively small. The major municipal requirement is the Hancock water supply system (approximately 0.5 mgd) which serves approximately 1,100 people. There are no known industrial withdrawals. During the summer season, irrigation is a major water use, particularly in the area between Sideling Hill and Tonoloway Creeks. Volume VI of the Report projects an irrigation requirement in the four watersheds of 97 million gallons a month in 1985 and 165 million gallons a month by the year 2010 for the peak month of July. The peak month requirement is about 30 per cent of the total irrigation requirement for the summer season.

A survey of water quality by the Public Health Service indicated that the four tributaries were relatively free from pollution and could be used for water supply. Quality on the main stem Potomac in the area of Paw Paw, West Virginia (between Town Creek and Sideling Hill Creek) was below standard objectives largely as a result of waste loadings from the North Branch area. Above Hancock, the water quality is much improved because of a rapid natural self-purification capacity and good quality tributary water

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* The population data contained in Vol. V, pp. 470-471 are substantially in error. The population of Hancock is more than that listed for the 4 watersheds. That portion of Allegany County in the Town Creek and Sideling Hill watersheds is omitted entirely.

entering below Paw Paw. Hancock, formerly releasing its sewage untreated to the stream, is now constructing a sewage lagoon. Below Hancock, both organic and inorganic wastes enter the stream via Warm Springs Run (West Virginia). The stream improves in quality by the time it reaches the Hagerstown intake.

Within the four-tributary area, the Corps proposes to construct three major reservoirs. One is entirely in Maryland on Town Creek; the other two are mostly in Pennsylvania on Tonoloway and Licking Creeks although a portion of each is in Maryland. The projects are to serve primarily for flow supplementation (water supply and water quality) in the Washington Metropolitan Area which includes portions of Maryland and Virginia. Recreation is also a major project purpose, particularly in Town Creek. In West Virginia, the North Mountain project is proposed for construction on Back Creek. An adequate supply of water was determined to be available for all anticipated quantity and quality needs in the sub-basins within Maryland. Only one headwater reservoir (Town Creek) is proposed for the Maryland area and it is to serve downstream augmentation purposes.

To the extent that 1) the downstream benefits stemming from the flow augmentation provided by these projects will accrue to Maryland portions of the Potomac Basin; 2) that this additional stream flow is needed; and 3) that upstream storage is the most feasible means of providing additional water, then the projects must be considered desirable from a State perspective. Impact of the projects on the local area involved, however, must be considered in view of the fact that augmented flow will only result in incidental quantity and quality benefits in this stretch of the Potomac. Additional recreation opportunity is the primary local benefit resulting which must be weighed against the existing recreation opportunity lost and the loss of productivity from the land inundated.

The Maryland State Board of Agriculture and the State Soil Conservation Committee indicate concern over the removal of any land from agricultural production because of local impact. They state, however, that this land represents but a small part of the total farm land in Maryland, in particular the three sites being considered here - Town Creek, Tonoloway Creek and Licking Creek.

In its appendix to the Corps' Report, the National Park Service comments on the gains and losses of recreation opportunity resulting from construction of the Corps' projects. The National Park Service, normally staunch protectors of wilderness and other forms of undeveloped recreation, conclude that the three reservoirs would create more recreation opportunity than could be offered without impoundments. The excellent water quality at the three sites will be conducive to all forms of water-oriented recreation. Similarly, the U. S. Fish and Wildlife Service projects a substantial increase in fishing opportunity and value with construction of the projects. Loss of wildlife habitat is proposed to be mitigated by the acquisition of suitable land away from the site area.

Notwithstanding problems of interstate jurisdiction, the three reservoirs would provide significant recreation opportunity in the region that would be attractive to visitors from as far away as the Baltimore and D. C. Metropolitan Areas if properly developed and administered. The Town Creek project would be the most significant to Maryland because it is totally within the State and is located in an area where water recreation development is at a minimum. To maximize recreational potential, a regional master plan must be formulated which will take into account not only the Corps' sites but also existing and proposed State developments

(e.g. Maryland's Rocky Gap site). Such a plan should recognize and protect the particular recreational attributes of each of the sites so that the total development offers a diversified and well-balanced program.

Summary of Comments - State Agencies

Game and Inland Fish Commission:

It is believed that development of the surface water resources of the Potomac Basin can be accomplished without the necessity of building any major main stem reservoirs. Should the Corps' recommended plan be implemented, the following comments would be pertinent to each of the projects concerned.

1) Town Creek - A high yield in man-days of fishing is represented in this site. Since it is located in an area where impoundment fishing is now merely in existence, the benefits would tend to make up for the loss of wildlife lands.

2) Tonoloway and Licking Creeks - These reservoirs are also in the area of few public fishing impoundments. They represent equal fishing potential (although neither are entirely in Maryland) and nearly equal loss of wildlife habitat.

State Soil Conservation Committee:

In general, the Soil Conservation District Boards of Supervisors favor the upstream storage of water in reservoirs or small headwater structures. The District Supervisors do not oppose large dams and recognize that some sacrifice may have to be made in order to obtain the greater public benefit. Neither Town, Tonoloway nor Licking Creeks will remove much land from the agriculture in Maryland.

Department of Forests and Parks:

Licking Creek - This project will provide a recreational area that might be partially in Maryland and all would be readily acceptable to Maryland residents of the Hancock-Hagerstown area.

Town Creek - This will be a major recreational factor in the Cumberland area; because of its timing, it is doubtful that it will have any serious impact on Rocky Gap State Park.

Tonoloway Creek - This will provide additional facilities in the Hagerstown-Hancock area.

Conococheague and Antietam Creek Sub-basins

Of the 855 square miles in the Conococheague-Antietam sub-basin, 252 square miles are in Washington County, Maryland. Conococheague Creek enters the Potomac River at Williamsport, Maryland about 100 river miles above Washington, D. C. Antietam Creek enters the Potomac near Sharpsburg, Maryland, 30 river miles downstream from the mouth of the Conococheague.

The 1960 sub-basin population of 176,000 is nearly equally divided between Pennsylvania and Maryland. 98% of the Washington County population is in the area. Hagerstown is the largest Maryland city included with a 1960 population of 36,000. Other population centers in the Maryland portion are Funkstown, Boonsboro, Sharpsburg and Williamsport. The Corps' population projections indicate that the Washington County population will increase 57% by 1985 and 130% by 2010 with three-quarters of this total residing in the Williamsport-Hagerstown water service area.

In the sub-basin, the main stem Potomac and both Conococheague and Antietam Creeks are utilized for water supply and receiving waste discharges. The Hagerstown-Williamsport system uses the Potomac as its primary source of water, withdrawing its supply from the river just above the mouth of the Conococheague. The Conococheague is not heavily used in Maryland; only one industrial intake and a few industrial outfalls are known to exist on the stream. On the Potomac between Conococheague and Antietam Creeks are located the intakes and outfalls of Sharpsburg, Maryland and Shepherdstown, West Virginia. Withdrawals from Antietam Creek are used for both domestic and industrial needs. Users include Hagerstown (a second source), Camp Ritchie and one industrial firm (North American Cement Company)

which has a daily requirement of over 18 million gallons. Discharges to Antietam Creek include the effluent from the Hagerstown Treatment Plant, other municipalities and public institutions, the cement plant mentioned and a number of industrial firms obtaining water from Hagerstown.

The Corps' program for this sub-basin of the Potomac contains no major reservoirs in Maryland. One project is scheduled for construction on the main stem (Chambersburg) and two on tributaries of the Conococheague (West Branch, Back Creek) in Pennsylvania. Another project proposed for construction (Winchester) is in Virginia on Opequon Creek which flows into that stretch of the Potomac between Conococheague and Antietam Creeks.

In the Conococheague sub-watershed, there are 22 headwater reservoirs proposed for construction, all of which are in Pennsylvania. (These projects are of the type constructed by the Soil Conservation Service under P. L. 566.) 68,000 acre feet of storage for water supply and quality control are included in the program. In the Antietam sub-watershed, a total of 9 impoundments, containing 50,000 acre feet of conservation storage, are proposed. Three located in Maryland, just above Hagerstown, contain approximately 13,000 acre feet of storage for water-quality control.

The effect of the Corps' program on the Maryland portion of the sub-basin can be more clearly understood after evaluating the existing and/or potential problem areas. (References to flow and water-quality data are from Vol. V. of the Corps' Report.)

1. The Potomac River at the Hagerstown water supply intake above the mouth of Conococheague Creek contains good quality water except for residual wastes from tanneries. Flows of the Potomac are expected to

be adequate for all withdrawal requirements for many years in the future. Upstream storage probably could provide only incidental benefits to this area.

2. Conococheague Creek is critically polluted in the Chambersburg and Mercersburg areas of Pennsylvania. The quality is considerably improved in the Maryland sector with the only problem being concentrations of tannery wastes. Water of suitable quality for domestic and industrial use exists in Conococheague Creek above Williamsport. Quality in the Conococheague is expected to improve upon completion of a new, activated sludge plant at Chambersburg. Low flow and quality improvements would also be expected from the construction of the major reservoirs and headwater impoundments proposed.
3. There is a degradation of water quality in the Potomac between Williamsport and the mouth of Antietam Creek because of waste loadings from Sharpsburg and Westernport in Maryland and Opequon Creek on the West Virginia side. All upstream projects would provide incidental benefits to this area.
4. Probably the most severe quality problem in the Maryland portion of the sub-basin exists in the Antietam Creek watershed. The stream is grossly polluted below Waynesboro in Pennsylvania and at Funkstown below Hagerstown. The condition is expected to become more serious as the population of Hagerstown grows and waste loadings increase. This prediction takes into account the recommended increases in sewage treatment. Three headwater impoundments are proposed for construction in Maryland between Waynesboro and Hagerstown. A number of similar structures are also proposed for the Waynesboro area. The Corps' Report recognizes the

water-quality problem in the lower Antietam watershed and suggests several possible solutions: a) further diversion of water from the Potomac for low-flow augmentation and b) piping effluent to the Potomac. Another possibility not considered in the Report is the diversion of water from the Conococheague once this source is improved in quality.

According to the survey made by the Public Health Service in conjunction with the Potomac study, recovery to relatively good quality water occurred in the lower reach of Antietam Creek. Except for metal plating wastes known to be discharged to the stream in the Hagerstown area, the waters entering the Potomac River from Antietam Creek are essentially unpolluted.

Recreation is a somewhat ancillary consideration in the selection of reservoir sites to be developed for water-supply and quality-control purposes. Where two or more alternative locations can provide the same flow augmentation, consideration of the recreation values can then be introduced as a determining factor. In the Conococheague watershed, water needs are primarily in the Pennsylvania sector and therefore, the major impoundments are located above Maryland. Recreation opportunities in Maryland would be appreciably increased if one or more of the Conococheague reservoirs were located further downstream. In view of the Pennsylvania situation, however, the relocation of proposed reservoirs from their present location would not be without substantial loss in benefits to be accrued from the flow supplementation. The two reservoir sites near Chambersburg (Back Creek and Chambersburg) are approximately 25 miles from Hagerstown. Highway transportation between Hagerstown and Chambersburg via U. S. 11 will be immeasurably improved with the completion of Interstate Highway 81.

Summary of Comments - Local and Other Governmental Agencies

County Commissioners of Washington County:

The County Commissioners question the flood control and recreation benefits to Washington County from the three Conococheague projects. Benefits would be much greater /to Washington County/ if one of the projects were located in Maryland.

Monocacy River-Catoctin Creek Sub-basins

The Monocacy and Catoctin sub-basins comprise an area of approximately 1,100 square miles of which all but 228 square miles is in Maryland. The Maryland drainage area includes nearly all of Frederick, and portions of Carroll and Montgomery Counties, the latter contributing only a small part to the total. The Frederick County area contains nearly 75% of the watershed population and includes all of the County's urban areas. Taneytown, Westminster, Union Bridge and New Windsor comprising nearly half of the Carroll County population, are in the drainage area. Damascus is the only urban area within the Montgomery County portion of the sub-basin.

Except for the City of Frederick, there is no city or town in the watershed containing 10,000 people. Another significant population characteristic, especially relevant in considering water development needs, is that the number of Maryland residents classified as "rural residential" approximates that of the "urban" total. The significant number of rural residents not engaged in agriculture is a characteristic of areas in close proximity to major centers of employment which at the same time, offering the amenities of country living which so many people find attractive. Both the rural

residential and the urban population are expected to comprise an ever-increasing share of the total watershed population in Maryland.

Frederick, Emmitsburg, Thurmont, Camp Detrick and the Maryland T. B. Sanitarium are the only users of the Monocacy as a source of domestic supply. Westminster obtains its water from a tributary of the Patapsco River. The remaining municipalities and towns use ground water as a source of supply. Ground water supplies are also used by many of the sub-basin's industries, most of which are involved in food processing. All of the waste discharges including Westminster are returned to the Monocacy and its tributaries with varying degrees of treatment.

The City of Frederick is not expected to encounter water-supply problems until some time after 1985. After 1985, deficits in supply are expected in the amount of 3 to 9 million gallons a day. Deficiences in domestic supply also are anticipated for Emmitsburg and Thurmont in Frederick County and Taneytown, New Windsor, Union Bridge and Westminster in Carroll County. Projections for Ft. Detrick indicate the need for an additional 175 mgd (millions of gallons per day) in 1980 and 1.75 mgd in the year 2000.

Operations of the Frederick County Sanitary Commission will include the providing of water to communities having no public systems. The Commission will probably concentrate its immediate efforts to the suburban areas outlying the City of Frederick. Impact of the Sanitary Commission's program will be an ever-increasing reliance on surface supplies.

The Commission presently is considering a source of supply on the Monocacy River just below Fishing Creek. Another possibility would be obtaining water from the City of Frederick.

Surface sources of water are expected to be heavily used for irrigation in the Monocacy and Catoctin watersheds. Projected acreage to be irrigated and accompanying water requirements are as follows:

Year	Acreage	Water Use (millions of gals/month)
1985	2,900	359
2010	2,600	783

According to the Corps' Report (and premised on treatment at 80 and 85 per cent levels by 1980 and 2010 respectively) low flow must be supplemented to produce a water quality meeting appropriate criteria (Class C, Interstate Commission of the Potomac River Basin). Based on a dependable low flow of 52 cfs (7 day/10 year frequency), increments of 29 cfs at present, 82 cfs by 1985 and 130 cfs by 2010 are considered necessary for quality control.*

In order to meet these anticipated water supply and quality control needs, the Corps of Engineers has proposed the construction of a dam and reservoir on the Monocacy about 6 miles southeast from Emmitsburg and twenty river miles above Frederick. By adding an additional 104 cfs to the dependable flow of the Monocacy and, operated in conjunction with 25 headwater

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* In its review, the Planning Department was unable to verify the justification for these increments of flow required. Supplemental flow for quality control is undoubtedly necessary and will be even more so in the future. Even under conditions of maximum practicable treatment, there still will be a substantial residual remaining in the stream. A more accurate determination of supplemental flow required for quality control can probably be made after a review of the plans being considered by the City of Frederick and the Frederick Sanitary Commission.

impoundments, the Six Bridge project is expected to provide for all anticipated water needs in the Frederick area. According to the Corps, Six Bridge also would enhance the recreational opportunity of the area and furnish additional water for the Maryland, Virginia and Washington, D. C. Metropolitan Areas downstream.

The major economic loss resulting from the construction of Six Bridge would be the inundation of land in one of the most productive agricultural areas in the Potomac River Basin. The site location is within the highly productive Washington, Baltimore and Lancaster milk markets and the demand for dairy products gives the entire area a high agricultural income. Although only a small part of the total farm land in the State would be involved, it would be of significance to those people directly affected particularly in view of the fact that farm management and improvements are at a high level.

Because the proposed site is located in an area of level terrain, recreational values would be detrimentally affected by drawdown of the reservoir which would expose unvegetated shoreline. Due to the flat characteristics of the reservoir, however, normal releases from the dam will cause very small drawdowns, approximately 1 foot during the May to September recreation season in an average year. The effect of drawdown at Six Bridge (and at any other site) must also be viewed from another standpoint: when abnormal drawdown is required, it is because of a need for additional quantities of water downstream. Under these circumstances, water supply and quality control requirements must certainly take precedence over recreation.

Recreation potential of the Six Bridge project is estimated by the Corps at 300,000 user days annually. Projections of the National Park Service are even higher. A net increase over present use of the proposed 3,500 acre reservoir and downstream stretch of the river for fishing is estimated at 104,000 man days.

To maximize recreation opportunity, the planning of recreation facilities at Six Bridge must also take into account existing and planned development elsewhere in the immediate area. Of particular concern here is a 50-acre reservoir in Cunningham Falls State Park proposed for construction. The relatively small impoundment would complement the existing land-oriented recreational facilities in the 4,500 acre state park whereas the major recreational opportunity at Six Bridge would be provided by the reservoir itself. Also the type of recreation activity provided by a 3,500 acre reservoir is quite different than that afforded by a 50-acre impoundment. In respect to these two projects, there does not appear to be any conflict or duplication of recreational development. This situation does point out the need, however, for a master recreational plan which identifies the special attributes of each project and recognizes the relationship of individual facilities to an overall, comprehensive program.

Anticipated water needs elsewhere in the sub-basin can be satisfied by headwater reservoirs. By augmenting dependable flows, reducing the amount of sediment entering the main stem and alleviating water-quality problems in the upstream areas, the headwater impoundment program would also result in beneficial effects downstream by supplementing stream flow and improving water quality, particularly in the proposed Six Bridge Reservoir. Of the

41 upstream projects proposed for the Monocacy sub-basin, 19 are in Maryland.

Summary data on the upstream program are as follows:

Sub-Watershed	No. of Projects		Storage		Conservation Storage		Acreage	
	Total	Md.	Total	Md.	Total	Md.	Total	Md.
			(acre-feet)		(acre-feet)		(acres)	
Big Pipe Creek	14	14	45,398	45,398	27,662	27,662	1,445	1,445
Upper Monocacy	19	2	67,840	4,563	48,951	2,908	2,614	118
Tom Creek	6	1	20,965	2,900	12,416	-	691	21
Middle Monocacy	2	2	9,519	9,519	9,204	9,204	294	294
TOTALS	41	19	143,722	62,380	98,233	39,774	5,044	1,878

Excerpts from the Corps' report (Vol. VI, p. 76) indicate the Maryland areas to be serviced by the upstream projects:

(1) In the Thurmont, Maryland, area there is an estimated requirement of 8.3 cubic feet per second of supplemental flow from storage. Two dams will provide the needed supplemental flow. Collectively, they yield 8.6 cubic feet per second at maximum development. [The Thurmont situation might be changed somewhat in view of the proposed State project on Cunningham Falls.]

(2) In the Emmitsburg, Maryland, area there is an estimated requirement of 9.6 cubic feet per second of supplemental flow from storage. Two dams will provide adequately for these needs. They will yield 12.6 cubic feet per second of supplemental flow at optimum development.

(3) In the Gettysburg-Littlestown area [including Taneytown] there is an estimated need for 65.7 cubic feet per second of supplemental flow from storage. Thirteen structures can supply all the water supply needs and most of the needs for water quality. Collectively, they will yield 49.2 cubic feet per second of supplemental flow. This will result in a deficiency of about 16 cubic feet per second of flow for stream quality improvement.

(4) In the Westminster-New Windsor-Union Bridge area there is an estimated need of 38.3 cubic feet per second of supplemental flow from storage. Eight dams can supply a part of these needs. Collectively, the yield from these structures is estimated to be 32.0 cubic feet per second of supplemental flow. This will adequately provide for the water supply needs,

but there will be a slight deficiency in water for stream quality improvement. The amount of this deficiency will depend largely on how much of the effluent from Westminster is discharged into tributaries of the Potomac River.

Summary of Comments - State Agencies

Game and Inland Fish Commission:

It is believed that development of the surface water resources of the Potomac Basin can be accomplished without the necessity of building any major main stem reservoirs. Should the Corps' recommended plan be implemented, the following comment would be pertinent to the project concerned.

1) Six Bridge - Fishing opportunity here would be substantial, while loss to wildlife lands would be medium. Due to its large size and consequent flooding of valuable lands, it is assigned a low priority.

State Soil Conservation Committee:

In general, the Soil Conservation District Boards of Supervisors favor the upstream storage of water in reservoirs or small headwater structures. The District Supervisors do not oppose large dams and recommends that some sacrifice may have to be made in order to obtain the greater public benefit. Concern has been registered over the inundation of farm lands by the dam on the Potomac at Seneca and the dam on the Monocacy.

Department of Forests and Parks:

This project will provide a large amount of recreational use because of its proximity to Cunningham Falls, its effect on the proposed impoundment there should be considered in making our plans. Recreational plans include two major areas in Maryland.

Department of Chesapeake Bay Affairs:

From the standpoint of the Department, the following are the essential criteria: 1) reduction of sediment load carried into the Potomac estuary; and 2) delivery of the most uniform obtainable flow of water below Little Falls. Therefore, it appears that the Seneca and Monocacy River projects are of primary interest to us and we hope that these will have high priority in the schedule of construction.

Summary of Comments - Local and Other Governmental Agencies

Frederick County Planning and Zoning Commission:

As the primary purpose of the Corps' program is to help the District of Columbia solve its water sewage problems, Frederick County should not be called upon to pay anything for the construction or maintenance of dams at

Six Bridge or at Seneca. Also, the loss of taxes and the value of real estate taken for the projects should be reimbursed to the County.

While condemnation of property to meet the needs of water supply may well be justified, condemnation of property for recreational purposes and to preserve wildlife cannot be justified. It is a bad and terrible thing to force an owner to sell his home or farm to meet some need that is not absolutely essential. At the Six Bridge site, about 5,000 acres of land would be condemned for water needs alone, while about 7,500 acres would be condemned if recreation is included.

County Commissioners of Carroll County:

The Commission generally approves the construction of a reservoir at Six Bridge providing:

1. That an unlimited supply of raw water be made available without cost for the future use of Carroll County, its communities, and citizens.

2. That provisions be made for the utilization of water from the reservoir for irrigation of adjacent farm lands.

3. That the matter of the degree of treatment of sewerage disposal system, both public and private, be clarified as well as the monetary aids for providing any corrections or additions to existing public or private systems needed to meet any such requirements.

4. That clarifications be made regarding potential regulations for protection of the reservoir waters from effluent from existing and/or new farm facilities and/or lagoons from which there may be run-off.

5. That clarification be made as to the exact and type taking of land adjacent to the reservoir and its protective area as well as the restriction which may be imposed as to public access or use.

6. That clarification be made as to types of recreation, the control thereof, and the agency or agencies for which such control is to be given.

Summary and Recommendations

Summary

1. The Potomac River and its tributaries currently serve the water needs of over three million people, including approximately one million residents of Maryland.
2. The water resources of the Potomac River system are adequate to meet all requirements far into the future provided they can be made available at the right times and the right places. Extreme variability in the stream flow of the Potomac, however, creates problems of excess and deficiency.
3. According to the Corps' Report and other independent evaluations based upon projections of population and economic activity, water supply shortages, particularly in the Washington Metropolitan Area and in the North Branch Area above Cumberland, are expected to occur prior to 1985.
4. The North Branch and other areas of the Potomac River Basin are faced with serious water-quality problems. Additional stream flow and a high level of waste treatment will be required to sustain an acceptable quality of water in the river system. Improving water quality in the Potomac estuary poses a very complicated problem because of tidal movements.
5. Smaller tributaries of the Potomac are subjected to severe flash floods from heavy downpours. In contrast, the main stem and larger reservoirs absorb these flash floods, but are subject to flooding after prolonged, widespread and heavy rains. Over a long period, flood damages in the Basin are estimated to average $8.5 million annually.

6. As populations grow and technologies improve, there will be more people with more time to spend in recreational pursuits. This increasing demand is combined with a well substantiated preference for water-oriented recreation.
7. Water requirements in the Potomac Basin can be met only by a program of control and development. Careful analysis of available information and possible alternatives clearly indicate that a system of water storage providing increased stream flow is necessary to meet these needs.
8. The augmentation of stream flow is not a substitute for adequate waste treatment which must accompany any program of control and development.
9. The recommended plan of the Corps consists of 16 major reservoirs, 418 headwater reservoirs, 4 trunk sewers required in connection with 3 major reservoirs, 3 small flood-control projects already authorized under Public Law 685, non-structural conservation measures to reduce erosion and rapid localized runoff, and compatible recreation developments. The Corps' program is predicated on a level of waste treatment averaging 85 per cent throughout the Basin by the year 2010 except in the Washington Metropolitan Area where 90 per cent treatment will be necessary.
10. Seven major reservoirs located either totally or partially in Maryland are proposed for construction. 43 headwater reservoirs are also recommended for construction in Maryland.
11. Cost sharing is based on present statutes, particularly on the provisions of the Water Supply Act of 1958 and the 1961 amendments to the Federal Water Pollution Control Act. Federal costs include those allocated to:

(a) flood control;

(b) low-flow augmentation for water quality control where the benefits are widespread and the augmentation is not a substitute for adequate local waste control; and

(c) essential facilities for recreation.

Water supply costs must be reimbursed to the Federal Government by the users.

Recommendations

Major Projects

With respect to the major projects proposed for construction either totally or partially in Maryland, the following recommendations are made:

1. Bloomington (1965)* - Recommended for immediate construction.

   This project has already been authorized and advanced planning studies are now being conducted. Because of the critical need for this project in the North Branch area, it is recommended that every effort be made to expedite its completion.

2. Six Bridge (1971)* - Recommended for construction.

   While the eventual need for this project is certain, the proposed date of construction is subject to further consideration in view of proposed programs for water-quality improvement in the Frederick area. An early priority still may be justified because of low-flow augmentation needs in the D. C. Metropolitan Area. Recommendation of a construction

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* Scheduled completion date.

date must await a re-evaluation of the local situation and the results of additional studies now underway concerning the Seneca project.

3. Seneca (1977)* - No recommendation pending further study.

   Seneca is the principal project involved in meeting water supply and quality control requirements in the Washington Metropolitan Area and the Potomac estuary. The other upstream projects, however, are designed to contribute a portion of the augmented flow needs. Studies are now being conducted to determine whether this augmented flow will improve water quality in the estuary. If the findings are negative, then the justification for that portion of the total storage provided in the system for quality control in the estuary is in question. The studies now being conducted will therefore have implications for the entire program (insofar as projects and scheduling) which, under any circumstances, must satisfy upstream needs as well as to provide the D. C. Metropolitan Area with a dependable and good quality source of water supply.

4. Town Creek (1993)* - Recommended for construction.

   The project will provide storage for downstream water needs at a relatively low cost. From a local viewpoint, and based on a need for water-oriented recreational facilities in the area, the construction date of this project should be moved foreward considerably.

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* Scheduled completion date.

5. Savage II (1998)* - Recommended for construction.

The water development program for the North Branch sub-basin includes the previously discussed Bloomington project and a second reservoir on the Savage River in Maryland. (A third project, Mt. Storm, is proposed for construction on the Stony River in West Virginia.) Construction of Savage II will enable maximum use of the Savage River as a source of water supply for this region of Western Maryland, particularly in the Cumberland area. Recreation opportunity will be enhanced considerably, primarily due to the beneficial effect this project will have on drawdown operations at the existing Savage River reservoir. The construction of Savage II should be updated in view of its regional benefits. Cost allocations for Savage II must be carefully conceived so as not to create an undue burden on the non-Federal interests, particularly those who will be involved in the cost sharing of more than one project in the North Branch

6. Licking Creek (1987)* and 7. Tonoloway Creek (2007)* - Recommended for construction.

Both of these projects are located on the Pennsylvania-Maryland border with most of the proposed reservoir area in Pennsylvania. These projects would provide additional water downstream to meet anticipated requirements. Since no shortages of water are expected in the Maryland portion

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* Scheduled completion date.

of the two sub-basins, the principal benefit to the local interests in this State would be the increased recreation opportunity. Improved accessibility to these sites via Interstate Highway 70 would indicate substantial recreational use by Maryland residents.

Headwater Reservoirs - All projects recommended for construction.

In addition to the 16 major projects, the Corps' plan recommends construction of 418 headwater reservoirs of which 43 are in Maryland. Contingent upon further review by County and State Soil Conservation Committees, these projects are recommended for construction.

Two aspects of the small watershed program requiring further comment relate to the use of headwater reservoirs for low-flow augmentation and recreation.

Several of the proposed impoundments to be built for low-flow augmentation purposes alone (water supply and/or water quality) are in sub-watersheds where no other projects are required. Under the present small watershed law (P. L. 566), these single-purpose impoundments cannot be built unless other projects are included in the sub-watershed for land treatment and management. Irrespective of this limitation, these small impoundments are the most feasible means of providing water for areas that cannot be serviced by the major reservoirs. The impression conveyed in the Corps' Report is that these projects would be built under the Small Watershed Law; if this is not possible, other means of construction, financing and management of these impoundments should be considered.

There is no provision for public lands around or access to projects built under P. L. 566. Unless the projects are located on public land, the public cannot lawfully use the impoundments or their shoreline for recreation. In the Maryland area alone, the water surface acreage of the headwater reservoirs containing conservation storage totals more than 3,000 acres; only 128 acres are located on public land. Consideration should therefore be given to a modification in the existing law so that the potential recreational opportunity at these sites can be fully developed.

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Summarizing the construction phase of the Corps' Report, all projects either totally or partially in Maryland are recommended at this time with the exception of Seneca. A final State position on Seneca must await the completion of studies now in progress concerning the effect of the proposed project on water quality in the Potomac estuary. The studies also will have implications for the upstream projects insofar as their relationship to low-flow augmentation needs below the Metropolitan Area. No adverse views are expressed concerning projects proposed for contruction in neighboring states.

Upon completion of the studies now being carried out and in consideration of the views of the affected states, a revised schedule of construction will probably be required. This new schedule should differentiate between those projects to be built in the near future and those in the more distant years of the program. For those project locations at which land is not to be acquired almost immediately, a program of site preservation should

be instituted which would not interfere with present land uses. The need for protection of reservoir sites is particularly true in the case of Seneca which may still prove to be the most logical source of water for the Metropolitan Area. In the absence of a suitable alternative, the State cannot afford the risk of losing the Seneca project to subsequent development which will forever prohibit its construction.

Implementation of a Development Program

Recommendation for a continuing planning and research program.

Although the Corps' study was far more comprehensive than previous investigations of the Potomac, still it had to rely on criteria and assumptions that may not hold up over time or, are not applicable in particular situations. These limitations necessitate a continuing surveillance of the program, supported by additional studies and research. Only with this planning and research support can a basin plan be kept current and a useful instrument in guiding resource development.

Recommendation for the establishment of a basin coordinating agency.

Certain administrative activities are requisite to the effective implementation of a development plan. The more important functions involved are:

1. To allocate project services and the non-Federal costs among beneficiaries.
2. To collect revenue and pay the non-Federal share of project costs.
3. To preserve sites of those reservoirs not scheduled for immediate construction.

4. To provide management and maintenance services for reservoirs, local protection projects and recreation areas.

These functions as well as the planning and research activity mentioned previously can best be accomplished by an organization which is representative of those directly concerned with development in the Basin, namely the states and the Federal Government. In addition to these responsibilities and others which may be delegated, the agency could provide the means for coordinating activity and reconciling conflicts among the many divergent interests represented in the Basin. Only through the cooperation of the states and the Federal Government and the coordination of their activity in the Basin can there be assurance that a development program will achieve its intended objectives. Structure of the agency and its specific functions need not be determined now; at this time, it is necessary only to recognize the need for a Basin organization and to recommend that immediate consideration be given to its establishment.

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Cost Apportionment

Under existing legislation there are certain obligations placed on potential users of water stored in reservoirs for water supply (and in some instances, water quality. This is not pertinent in the seven major projects proposed for construction in Maryland.) Prior to construction of a project, responsible non-Federal interests must give assurances satisfactory to the Secretary of the Army that they will repay the costs allocated to water supply during the life of the project (i.e. 50 years from construction.)

Initial users must make firm commitments whereas future users are required only to give reasonable assurance that they will require the provided water and will pay for it when actually used.

The non-Federal allocations represent only a relatively small percentage of total project costs. The amounts are still quite substantial, however, and could be extremely burdensome on the local communities and areas affected. Before committing themselves to a repayment program, the State and the local governments are anxious to explore every avenue of assistance that may be available on both the national and regional levels.

Although the Corps' Report indicates the non-Federal beneficiaries in very general terms, it is not in sufficient detail to determine precise allocations. The Report, for example, does not define the portion of costs to be allocated between West Virginia and Maryland users of water from the Bloomington Reservoir. Nor in the case of the proposed Seneca project is there an apportionment of costs among Maryland, Virginia and the District of Columbia. Firm commitments on the part of the State, or more likely, counties and municipalities in the State, must be postponed until a detailed allocation is made.

Although allocations of cost have not been made among non-Federal interests in Maryland and West Virginia, advanced planning for the previously authorized Bloomington project is nearing the stage where firm commitments from prospective water users will be necessary. The State and the Western Maryland counties involved are aware of the urgency in formalizing an agreement with the Department of the Army and presently have the subject under consideration. When similar problems of allocation and interstate cooperation

arise in projects to follow, it is hopefully anticipated that an interstate agency will be active and in a position to resolve these difficulties.

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Role of the State

Maryland has a vital interest in the development of the Potomac River Basin. Aside from the fact that nearly 40 per cent of the State's area and a third of its population is in the Basin, probably just as significant is the realization that the Potomac is a Maryland stream. Although the cooperation of the other participants in a Basin plan is necessary, the establishment of an interstate agency coordinating their activity will not in any way diminish the responsibilities of the State and its political sub-divisions. Development of the Basin will more than likely create new responsibilities for the State agencies and local governments in addition to expanding present activities.

The State must continually review proposed development in the Basin with respect to its implications for other State-wide programs. Caution must be exercised so as not to create an imbalance of expenditures and resource activity in this Basin to the detriment of other areas in the State. As a result of a recent reorganization of its resource agencies, Maryland is now in a better position than at any previous time to ensure proper development in its portion of the Basin as well as to collaborate with other states and the Federal Government in cooperative activities.

APPENDIX A

Letters from State Agencies

Department of Chesapeake Bay Affairs

of Maryland

July 3, 1962

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Mr. James J. O'Donnell, Director
State Planning Department
301 W. Preston Street
Baltimore 1, Maryland

Dear Mr. O'Donnell:

This is written in response to your request for statements from the several Natural Resource Departments concerning our positions on the plans of the Corps of Engineers for development of the Potomac River Watershed. From the standpoint of the Department of Chesapeake Bay Affairs, the following are the essential criteria: (1) the reduction of sediment load carried into the Potomac estuary; and (2) delivery of the most uniform attainable flow of water below Little Falls. Therefore, it appears that the Seneca and Monocacy River Projects are of primary interest to us, and we hope that these will have high priority in the schedule of construction.

Sincerely yours,

/S/ Joseph H. Manning,
Director

JHM:bsa

DEPARTMENT OF FORESTS AND PARKS
Annapolis, Maryland

COMMENTS ON THE POTOMAC RIVER BASIN REPORT CORPS OF ENGINEERS

The Potomac River Basin plan, as proposed, will have considerable impact on Maryland outdoor recreation.

Two major state areas will be affected. The size and expansion of Seneca Creek State Park must be considered in light of the Seneca (or its alternate - Riverbend) Dam.

Development of an impoundment at Cunningham Falls should also be seriously studied in light of proposals for large areas at Six Bridge, Chambersburg and West Branch, all early in the schedule of construction.

The scheduled construction dates must be realized as proposals that are already off schedule.

Savage II could well be advanced in priority.

Proposed state developments, other than those mentioned above, would not be seriously affected.

One other effect on the State of Maryland should be noted. The general policy of the Corps of Engineers has been to provide the recreational facilities at reservoir sites, but where there is an existing state park agency to turn the areas over to this agency, under long term lease, for operation. With the possible exceptions of Seneca or Riverbend, and Six Bridges, this will probably be the policy in the Maryland portion of the Potomac Basin. Personnel and funds will thus be needed as the areas become operative.

For the most part, estimates of recreational use appear to be on the conservative side.

Notes on the individual projects which would have most effect on Maryland follow.

1) Bloomington Project - Scheduled completion - 1965

The recreational use of this reservoir will all be based on the Maryland side of the River. If, as is many times the case, the Corps of Engineers plans include operation of the recreational facilities by the state, presumably Forests and Parks, enough land should be acquired, by state action if necessary, to ensure adequate room for operation and protection.

This reservoir can well ease the burden of water recreation which in the case of recreational boating is rapidly reaching the saturation point at Deep Creek Lake. Camping, boating, and other water based activities should be highly developed.

2) Chambersburg Project - Completion Date 1969.

This area will be readily accessible to many Maryland residents. Due to its high priority, serious consideration should be given to its effect on the proposed Cunningham Falls project. Recreational use estimates appear to be conservative.

3) Six Bridges Project - Scheduled Completion 1971.

This project will provide a large amount of recreational use. Because of its proximity to Cunningham Falls, its effect on the proposed impoundment there should be considered in making our plans. Recreational plans include two major areas in Maryland.

4) West Branch Project - Scheduled Completion 1972.

This project will also provide facilities within easy driving distance of the Hagerstown area. It should also be considered in conjunction with the development at Cunningham Falls.

5) Seneca Project - Scheduled Completion 1977.

This project will have a definite effect on Seneca Creek State Park, since it will flood much of the proposed take between Maryland Route 118 and the Potomac River. Proposed plans of operation would leave much of this area as mudflat during the summer months.

The development of a proposed lake on the state park area would be outside the area flooded and will provide needed water areas now.

6) Licking Creek Project - Scheduled Completion 1987.

This project will provide one recreation area that might be partially in Maryland and all would be readily accessible to Maryland residents of the Hancock-Hagerstown area.

7) Mt. Storm Project - Scheduled Completion 1991.

Relatively small recreational use is envisioned for this project. It will apparently have little effect on Maryland.

8) Town Creek Project - Scheduled Completion 1993

This will be a major recreational factor in the Cumberland area. Because of its timing, it is doubtful that it will have any serious impact on Rocky Gap State Park.

9) Savage II Project - Scheduled Completion 1998.

The proposed operating plan for this reservoir will make Savage I more attractive and its development for recreation more

feasible by maintaining water levels there.

The Savage I area, mostly owned by the Department of Forests and Parks, can become a major recreational development.

10) Tonoloway Creek Project - Scheduled Completion 2007.

This will provide additional facilities in the Hagerstown-Hancock area.

STATE OF MARYLAND
GAME AND INLAND FISH COMMISSION
STATE OFFICE BUILDING
P.O. Box 231. - Annapolis

C
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P
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Mr. James J. O'Donnell, Director
Planning Department
301 West Preston Street
Baltimore, Maryland 21201

January 7, 1964

Dear Mr. O'Donnell:

I have your letter of January 2 relative to the request of Mr. Joseph Manning, Chairman of the Board of Natural Resources, to prepare in writing this Commission's views with respect to the Corps of Engineers' Potomac River Basin Report recently approved by the Board of Engineers for Rivers and Harbors.

Please be advised that the Maryland Game and Inland Fish Commission submitted its general views and statement of evaluation of Corps of Engineers' Potomac River Basin development plan on August 14, 1962, having been approved by the Commission at its quarterly meeting on July 27, 1962. The Commission has not reviewed the Corps' amended report; however, it is our opinion the views of this agency are clearly reflected in the report referred to above.

In compliance with your invitation, I am sending Mr. Nelson Bevard, Civil Engineer, to attend the scheduled meeting in the office of the Planning Department Tuesday, January 14, 1964, at 10 A. M. He is familiar with the Potomac River Basin Report and will be able to enter into the inter-agency exchange of views at the meeting.

With kindest regards, I remain

Sincerely yours,

(s) Ernest A. Vaughn

Ernest A. Vaughn
Director

COPY

August 14, 1962

MARYLAND GAME AND INLAND FISH COMMISSION'S GENERAL VIEWS AND STATEMENT OF EVALUATION OF CORPS OF ENGINEERS' POTOMAC RIVER BASIN DEVELOPMENT PLAN

Any future water resources development plan for the Potomac River Basin will have a vital and permanent effect upon the State of Maryland and neighboring States. It is, therefore, of tremendous importance that the long range effects of any proposed plan be carefully studied and weighed against possible alternatives which would accomplish the desired result.

Basic results to be achieved by the development plans proposed by the Corps of Engineers include adequate future water supply for metropolitan Washington and other cities of the Basin and "pollution dilution", or a means to flush accumulated pollution past the city of Washington. These are to be achieved by a complex of highly expensive dams on the main stem of the Potomac River and its tributaries.

This Commission believes that these end results can be brought about by methods more in keeping with the time honored principal of "wise use" of existing natural resources, and without clogging our streams and rivers with permanently defacing monuments of concrete.

At least one study ("Potomac Prospect", Coordinating Committee on the Potomac River Valley) shows existing natural water supplies to be adequate for the future, provided pollution is effectively eliminated and our waterways are kept clean. It seems infinitely more desirable to use the taxpayer's dollar for an effective pollution control system and preserve our natural environment than to pour millions into a system of dams to store "dirty" water for "relocating" pollutants from one area of the Potomac estuary to another. It is felt that the Corps' approach attacks the problem of water supply from the wrong direction: existing waters should be cleaned and made useable as the first step through effective purification systems backed up by legislation to curb and finally prohibit introduction of unpurified wastes into natural streams. Then, only if and when future needs clearly indicate that storage is necessary, plans should be made to provide small impoundments on the upper reaches of the watershed.

Other factors which we feel are salient and should receive considerable thought before any Corps plan is endorsed are listed:

1. Drawdown operation of proposed dams would negate much of the fishing and recreational value of the impoundment by exposing large expanses of mud flat which make access difficult or impossible. At the Seneca site, for example, nearly 15,000 acres of mud flats would be created to offend the eye and nose during summer drawdown.

2. A "fringe" benefit of the dam complex is to provide a settling basin for silt carried by the rivers. This insures (1) mud flats already

mentioned and (2) a substantial reduction in effective life of expensive dams. Some large structures in other parts of the country have completely filled with silt in less than 50 years. The fight against silt in streams should be waged on the land of the watershed, not in the stream.

3. Flood prevention should receive more emphasis than flood control. Again, the place to work is on the upper watershed. The TVA has admitted that its system of dams has not completely eliminated floods. River bottoms subject to periodic high water should be zoned to keep expensive developments out of danger zones.

4. Building huge impoundments in the waterways would disrupt existing economic and social conditions in the region and destroy large areas of unspoiled natural and historic environment. Again, using the Seneca site for example, 38,700 acres of high value residential and agricultural land in Maryland and Virginia, including many miles of the historic C & O Canal, would be forever lost or subjected to flooding easement by the government. Wildlife losses would occur on approximately 20,000 acres.

5. The threat in time of war to a densely populated metropolitan area, posed by large dams with disastrous flood potential should breaching occur, is a sobering thought. Contamination of a large domestic water storage reservoir by chemical or radio-active material would also produce widespread chaos.

6. Any of the plans proposed by the Corps would result in an increase of fishing opportunity from a purely quantitative standpoint, and only if adequate public access can be provided.

7. Any of the plans proposed by the Corps would result in a loss of wildlife habitat. To offset this loss, mitigation lands purchased specifically for wildlife are proposed. Before accepting the Corps' proposal, the Congress undoubtedly will seek places to trim costs. It is quite likely that funds for mitigation land acquisition would be among the first items to be reduced or eliminated.

In view of the foregoing and recognizing the need to plan for the orderly development, use, and enjoyment of all natural resources of the Potomac Basin, this Commission recommends for any development program as follows:

1. High quality water standards must be established and maintained.

2. Pollution abatement of both domestic and industrial wastes must be improved and expanded so as to obtain substantially complete treatment of all waste waters prior to discharge.

3. Land use practices, including woodland, agricultural, rural, urban, and metropolitan must be improved so as to minimize siltation, reduce runoff, and maximize retention of precipitation.

4. Provision must be made for the acquisition and development of land areas of useful size and shape bordering all reservoirs and the stream proper to permit of development and public enjoyment of recreational values.

5. Provision must be made for the acquisition and transfer to the respective states of other additional land areas within each of said states to be dedicated to intensive wildlife management practices and provide for public hunting as replacement for the loss of wildlife values of the land areas inundated by and associated with any reservoirs constructed.

6. Provision must be made, at the very outset, for the acquisition of all land areas needed for projected reservoirs, as well as the associated areas necessary for useful recreational development and the non-associated areas necessary for wildlife development and public hunting to offset the values destroyed by the construction of reservoirs.

7. The plan for development must provide for an orderly and integrated program of water quality control, including improvement in pollution abatement and land use practices, coupled with the construction of small watershed control impoundments followed progressively and only as needed by major upper basin reservoirs.

It is believed that development of the surface water resources of the Potomac River Basin above Washington, D. C., in the manner as before indicated, will permit the benefits of present and future research to be utilized as time progresses and thereby provide adequate supplies of high quality water for the populace and industry of the Basin without the necessity of building any major main stem reservoirs.

Should the Corps' recommended plan be implemented, fishing opportunity will be enhanced. On the other hand, lands now productive of wildlife and available for hunting will be lost. These, and other factors, have been considered in assigning the following suggested priorities to the seven proposed reservoir sites:

1. SAVAGE RIVER: This impoundment would result in the least loss of wildlife lands yet return a fair amount of fishing opportunity.

2. TOWN CREEK: A high yield in man-days of fishing is represented in this site. Since it is located in an area where impoundment fishing is now nearly non-existent, the benefits would tend to make up for the loss of wildlife lands.

3. TONOLOWAY CREEK and 4. LICKING CREEK: These reservoirs are also in the area of few public fishing impoundments. They represent equal fishing potential (although neither are entirely in Maryland) and a nearly equal loss of wildlife habitat.

5. NORTH BRANCH: This impoundment represents only modest fishing potential and is also located relatively close to Deep Creek Lake. Wildlife loss would also be relatively low.

6. MONOCACY RIVER: Fishing opportunity here would be substantial while loss to wildlife lands would be medium. Due to its large size and consequent flooding of valuable lands it is assigned a lower priority.

7. SENECA CREEK: It would be preferable that this impoundment be eliminated due to the high loss of natural scenic beauty, historic features, and generally valuable residential and agricultural lands. The extremely wide fluctuation of water levels will undoubtedly replace a beautiful portion of the State with unsightly mud flats and barren reservoir sides. However, it could afford a great deal of recreational value provided water levels are properly managed and public access is assured.

STATE OF MARYLAND
DEPARTMENT OF HEALTH
301 W. Preston Street
Baltimore 1, Maryland

C O P Y

August 21, 1962

Mr. James J. O'Donnell
Director
State Planning Department
State Office Building
Baltimore 1, Maryland

Dear Mr. O'Donnell:

In response to your request of July 3, we have discussed the priority that we think should be obtained in the building of dams in Maryland as outlined by the Corps of Engineers in their Potomac River Basin Study. Of the sixteen projects enumerated we are primarily interested in three of them.

Our first choice is one in the Bloomington area. There is a critical need for water supply sources in Allegany County from the mouth of Georges Creek up to Frostburg, and from Frostburg down to Cumberland. Cumberland has had their possibilities studied by this office and others and there appears to be no alternative except to receive water from the Savage River or the Potomac. The other communities face pretty much the same situation. In addition to serving as a source of water, it will have the other advantages such as flood control and increasing the dry weather flow of the Potomac River from its location continuing downstream.

Our second choice is the Seneca project. This is not based primarily on the need for water in the area but due to the impact it will have upon the water supply for Washington and of diluting water to assist in assimilating treated sewage from the Washington area.

Our third choice is for Six Bridge with the dam on the Monocacy River. There is no immediate need for additional water in this area but due to the fact that it is not too far upstream from Washington, it will serve a similar purpose to that designated for the Seneca project.

The sixteen locations as designated all have merit and we hope that as time progresses finances may be made available to construct them. Some of them are out of the State but will influence the flow in the Potomac River. Any accomplishments along these lines will help in terms of flood control, water supply, industrial water, and water for assimilating sewage and industrial wastes.

Trusting you find these comments helpful, I remain

Yours very truly,

(s) Robert M. Brown

Robert M. Brown, Chief
Bureau of Environmental Hygiene

STATE OF MARYLAND
DEPARTMENT OF HEALTH
301 W. Preston Street
Baltimore 1, Maryland

C O P Y

July 7, 1964

Dr. Albert R. Miller
State Planning Department
State Office Building
Baltimore, Maryland

Dear Dr. Miller:

Attached herewith are our comments on the Corps of Engineers report on the Potomac River Basin. We have dealt only with those factors which concern themselves with public water supply and municipal waste disposal in relation to the maintenance of quality of the water in the Potomac.

I am sorry we have been delayed in getting this information to you.

Yours sincerely,

(s) Robert M. Brown

Robert M. Brown, Chief
Bureau of Environmental Hygiene

Attachment

MARYLAND STATE DEPARTMENT OF HEALTH

COMMENTS ON

POTOMAC RIVER REPORT

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Of all the projects planned for the Potomac River Basin, the development of a source of satisfactory raw water for municipal water supply in Allegany County is of primary health importance in Maryland. The need for additional water in the upper reaches of the basin, in order to provide for industrial growth and the assimilation of domestic sewage and industrial wastes, is also of major importance for the economy of the area and the health of the residents. This may be accomplished by building a dual purpose reservoir on the North Branch to elevate low flows in the river and to compensate for raw water to be withdrawn from the present Savage River Dam, supplemented in the future by a second reservoir on the Savage. The waters of the Savage River have a lower acid mine waste content than those of the Potomac, and therefore, are more desirable as a source of raw water supply.

Cumberland has about reached its economical limit in the storing of desirable raw water. Evitts Creek is impounded to its economical and yield limits. Except for raw water, taken from the Potomac River, Cumberland would need to impound Wills Creek, which is not a desirable source, or possibly Town Creek. Either development would be very expensive. Also storage would need be made in the Pennsylvania area of these streams and it may or may not be possible to negotiate such arrangements. Adjacent and other nearby growing areas are progressively depending upon Cumberland to supply them with water. Possibly the end point has already been reached in serving new areas until a supply from the North Branch can be secured.

The population now served by Cumberland is estimated to be 50,000. It is anticipated that Cumberland, and the area along the Potomac River to Westernport, will have a population of 70,000 by the year 2000. An estimate prepared by independent consultants agrees substantially with U. S. Army Corps of Engineers and indicates that the raw water needs for this area will increase from the 14 mgd of finished water now furnished by Cumberland to 31 mgd during the next 40 years. Of this latter amount 10 mgd would be required for residential and commercial properties and 21 mgd for industrial use.

A number of the communities in the Georges Creek Valley, from above Westernport up to Frostburg are desperately in need of an adequate and satisfactory source of raw water. Westernport is currently served by the Savage River Dam and Luke and the West Virginia Pulp and Paper Company draws on the Potomac for raw water. The future needs of this section, exclusive of Westernport and Luke, which were included in the figures previously given, are 2 mgd for residential use and 2 mgd for industrial purposes.

As low flows in the river are elevated due to increased reservoir capacity on the North Branch and the Savage River, additional industry will probably be attracted to the desirable industrial sites along the Potomac between Cumberland and Westernport. This in turn will involve greater re-use

of the river water, even with the increased flows. These additional uses would indicate a continuing need to re-evaluate the total water requirements and to determine water quality throughout the area. Additional treatment of domestic and industrial wastes could then be prescribed as needed to meet the water standards required for safe future growth. This information would also help determine the excess storage, for water supply, that should be built into a second Savage River or Stony River impoundment.

Releases from these dams would elevate the low flows of the Potomac along the upper reaches by a high percentage but would not be significant percentage-wise in the lower reaches. Throughout this area other impoundments, as recommended by the Corps of Engineers, should be created, as downstream needs and water quality requirements indicate such needs.

Relief in the Washington area is indicated in the near future because of the increasing demands due to the growth in population and the greater per capita use of water. In order to meet this need, time may not permit the building of numerous storage reservoirs on the headwaters of various major tributaries with varying rates of release to upgrade the low flows in the Potomac. In the absence of the River Bend project, a major project further upstream appears necessary. The Seneca project would appear a good alternative. It could supply Washington and adjacent areas with adequate raw water for domestic uses and provide additional stream flow to assist in assimilating sewage and other wastes from Washington and nearby areas.

To what extent the additional flow is necessary to avoid degrading the chemical and possibly the bacteriological quality of the estuary of the river, downstream from Washington is a matter of judgment tempered with calculations involving some unknown variables. A comprehensive program of chemical sampling of the river, below Washington, should be initiated and continued in the future, without interruption. The present program of sampling, downstream a short distance below Washington, should be extended well into the estuary.

It is well established that the bacteriological quality of the estuary water, particularly in the area of the natural oyster areas, has not been degraded to the point of restricting the taking of oysters. Such information is available from the year 1926 to date. What the increased organic load from the Washington area will bring about in the future must await analytical results progressively developed as time marches on.

Regardless of the need to provide additional flow in the estuary, the need for potable water in the metropolitan area around Washington will increase greatly during the next 40 years. The Washington Suburban Sanitary Commission which is now using about 22 mgd of Potomac River water estimates its needs for the year 2000 at 135 mgd. This requirement plus the additional needs of Washington and flow increases in the estuary would all point to the immediate need for construction of the Seneca project.

The requirement of 80%, 85% or 90% pollution removal, as recommended by the Interstate Commission on the Potomac River for all wastes reaching the Potomac River may not be realistic at this time. Increased flows will provide

additional dilution and will also add velocity to the river, enabling it to meet an oxygen demand more readily. Limiting the BOD in pounds, at various points along the river, as determined by the stream's capacity to provide oxygen, would be a preferable method. As oxygen should be adequate when greater flows are available, our concern would be the discharge of harmful bacteria. Even with primary treatment, adequate chlorination should provide the required protection.

MARYLAND GEOLOGICAL SURVEY
Latrobe Hall, The Johns Hopkins University
Baltimore, Maryland 21218

July 2, 1964

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P
Y

Mr. James J. O'Donnell, Director
State Planning Department
State Office Building
301 W. Preston Street
Baltimore, Maryland 21201

Subject: Potomac Basin Report of
Corps of Engineers

Dear Mr. O'Donnell:

Although it would obviously take many more man hours than are available in a small Department such as ours to completely review the Potomac River Basin Report, I have reviewed some portions of the report which are applicable to the functions of this Department. The following are some general comments on these parts:

1. Although Appendix 6 gives a general summary of the ground water resources which are present in the Potomac Basin according to our present state of information, I cannot find any place in the major part of the report where this source of supply is worked into the general scheme of the project. It appears from the statements on page 62, Volume 1, that this source has been dismissed because of various quality problems. It should be noted however, that groundwater can certainly act as a supplementary supply and can therefore free more surface water for low flow augmentation etc. In the recent past, there have been several large self-contained communities started on the Coastal Plain (Levittown - Belair and Crofton) which are using and will use groundwater exclusively and in large quantities (up to 3 million gallons per day for one development). There will probably be other such satellite communities developed on the Coastal Plain in the Washington metropolitan area and groundwater may prove the most economical source of supply thereby reducing the continuously rising demand on surface water.

2. I agree with the recommendation of the Board of Engineers for Rivers and Harbors (p.24) "that prior to the construction stage for the Seneca project detailed analyses be made of the complex water quality and tidal phenomena of the Potomac estuary, to determine whether the project is still the best overall means of fulfilling all of the water resources needs ......".

3. Only two test holes have been drilled at the Seneca site and both of these are on the Virginia side of the river. The inadequacy of this subsurface investigation has been recognized in the text but it still appears that even a tentative location of the major reservoir in the system should be supported by more geologic subsurface foundation data.

4. I have reviewed the geologic setting of each of the dams affecting Maryland and can find no objection from the standpoint of operating raw material operations or of potential mineral deposits.

As a general comment, the report appears to be very comprehensive and well conceived. There is certainly no doubt about the need for a project such as presented in this study.

Sincerely yours,

/S/ Kenneth N. Weaver
Director

KNW/res

UNIVERSITY OF MARYLAND
COLLEGE PARK

C O P Y

December 18, 1962

Mr. James J. O'Donnell, Director
State Planning Department
State Office Building
301 West Preston Street
Baltimore 1, Maryland

Dear Mr. O'Donnell:

Sometime earlier you contacted Dr. Gordon M. Cairns requesting any reaction that the State Soil Conservation Committee might have to the proposal for development of the Potomac River Basin. The State Soil Conservation Committee studied this matter and, following their study, brought this to the attention of the State Board of Agriculture for review. This resulted in the State Board of Agriculture approving the attached statement as representative of the views of the Board, and requesting that the statement be forwarded to you.

I am not sure that a copy of the statement was sent to you and, if not, this was due to an oversight on my part. I am attaching three copies for your use.

Very truly yours,

/S/ Albin O. Kuhn
Executive Vice President

AOK:LSW

ATT.

EVALUATION OF THE POTOMAC BASIN DEVELOPMENT PLANS BY THE STATE SOIL CONSERVATION COMMITTEE

The Maryland State Board of Agriculture is charged by law with "the general supervision, direction and control.....of all matters in any way affecting or relating to the protection and development of the agricultural interests in the state."

The State Soil Conservation Committee is organized under the State Board of Agriculture in accord with the provisions of the Soil Conservation District Law. The preamble of the law found in Article 66c of the Annotated Code of Maryland (1957) states under Section 89d:

> "Declaration of Policy - It is hereby declared to be the policy of the Legislature to provide for the conservation of soil and soil resources of the state, and for the control and prevention of soil erosion, and thereby to preserve natural resources, control floods, prevent impairment of dams and reservoirs, assist in maintaining navigability of river and harbors."

The State Board of Agriculture and the State Soil Conservation Committee have a direct concern in the development of the Potomac River Basin in Maryland. Among their interests is the land that may be removed from farming. It is recognized that the bottom lands of the Potomac Basin are usually more productive and have been farmed more intensively. The amount of land that will be removed from farming by the reservoirs and surrounding developments is important to the people affected. However, this land represents but a small part of the total farm land in Maryland. Furthermore, part of it may have been removed from farming prior to the scheduled dates of reservoir construction due to surburbanization and other factors.

The opinions and recommendations of the Soil Conservation District Boards of Supervisors in each of the districts in the basin were requested. In general, these Boards favor the upstream storage of water in reservoirs or small headwater structures. The District Supervisors do not oppose large dams and recognize that some sacrifice may have to be made in order to obtain the greater public benefit. The Montgomery District is concerned over the impact of a large dam below the mouth of the Seneca. Concern has been registered over the inundation of farm lands by the dam on the Potomac at Seneca and the dam on the Monocacy. None of the other five large reservoirs, namely: Bloomington, Savage II, Town Creek, Tonoloway, and Licking Creek will remove much land from the agriculture in Maryland.

The development of the small watershed protection and flood prevention structures in Maryland are of primary interest to the State Board

of Agriculture and the State Soil Conservation Committee. Under the Watershed Protection and Flood Prevention Act (Federal Public Law 566), the Committee was delegated by the Governor's office and State Board of Agriculture to review and approve applications for planning assistance on these small watersheds. Over twenty applications for planning assistance have been approved in Maryland. Of these, the Gilbert Run, Rock Creek and Little Antietam watersheds are located in the Potomac River Basin.

In the plans for the development of the Potomac River Basin, over four hundred small upstream watershed impoundments are recommended by the Corps of Engineers. These may be single or multi-purpose structures designed for flood prevention, local water supplies and/or recreation. Over forty are proposed in Maryland. Plans for five of these structures are in the Gilbert Run and Rock Creek Watershed projects.

Unfortunately, detailed reports of the studies have not been published and released for public consideration. Therefore, it has not been possible to make an objective detailed study at this time. In general, the losses of farm land from agriculture will not be important to the state's economy but will be of major concern to the individual owners. Construction of the major reservoirs in the headwaters are a progressive move toward the development of the basin. The small upstream watershed impoundments are desirable and will benefit the areas where they are located.

September 19, 1962

State of Maryland
Water Resources Commission

Statement of Opinion Regarding the Reports:

1. Potomac River Review Report
North Branch Potomac River
Above Cumberland, Maryland
Issued by the U. S. Army Engineer District, Washington

2. Potomac River Basin Study
Information Bulletin
Issued by the U. S. Army Engineer District, Baltimore

I wish to limit my remarks to the water quality aspects of the Corps of Engineers Potomac Basin Program. These reports of the Corps of Engineers include, (1) an excellent comprehensive summary of current water problems and projected future water needs in the Potomac River Basin and, (2) recommendations for meeting the present and projected - future water needs.

In the reports several alternative water control plans for a system of reservoirs to provide projected needs for water quality control are proposed. Water quality improvement benefits to residents and users of the Potomac River Basin will be the same in each of the alternative plans even though some of the reservoirs sites are varied.

Each of the plans presupposes maximum treatment of all wastes before discharge to the Potomac River. This, we wish to endorse. Waters of the Potomac River, to which treated wastes are currently being discharged, may be unattractive and unacceptable for many water uses. They may contain residual contaminants, not removed by normal treatment. These waters can be further purified and improved by natural processes in storage reservoirs. The natural processes that take place under conditions of large storage volume and long retention time, tend to reduce the treated waters of the residual contamination. The natural processes that further purify the treated waters are:

1. settling process - silt and other fine solids in stored waters settle to the bottom during the long retention time in the reservoirs.

2. oxidation and limited photosyntheses - residual oxidizable contaminants, mostly organic, that remain in the stored waters, are oxidized by natural oxidation and photosynthesis during the long retention time in the reservoirs.

3. diluting or dispersion process - residual concentrations of contaminants in stored waters are diluted by mixture with good quality water in the large storage volume of the reservoirs.

4. dilution benefits to downstream users from the controlled letdown.

It is agreed that the future economic growth and development in the Potomac River Basin will largely depend on an adequate supply of good quality water. The Corps of Engineers Reports, establish a current critical need for

(1). A sustained and controlled water supply - for periods of low flow as well as during periods of high flow

(2). Improved water quality

(3). Water quality control through water pollution abatement practices.

As indicated by the reports, these needs are becoming increasingly more critical as growth and development in the area progresses. To prevent interruption to the growth and development in the Potomac River Basin, a plan to supply current and future needs for good quality water, such as one or more of the proposed plans, must be adopted.

It is true that advanced technology to date indicates that the most economic and most feasible method for supplying sustained quantities of good quality water in a river basin, such as the Potomac River Basin, is the installation of a carefully planned system of reservoirs. In their reports, the Corps of Engineers proposes that each of the alternative plans for installation of a system of reservoirs will supply current and future good quality water needs to the year 2010.

Since the water quality benefits in each of the plans are the same, the Maryland Water Resources Commission would be inclined to support the plan that will afford the greatest amount of the other benefits that will be derived at the lowest cost and with the least number of sacrifices. It is my opinion that the first proposed plan in the report, Potomac River Basin Study, namely the Main Stem and Upper Basin Plan, will best meet these requirements and wish to recommend the following:

(1). Emphasis on the fact that success of the project to improve and control water quality in the Potomac River depends largely on the adequate treatment of all wastes before discharge to the River.

(2) Adoption and firm enforcement of regulations to prevent the use of dam reservoirs for:

a. a substitute for waste treatment facilities.

b. part of any water pollution abatement or control program.

It is felt that the water quality improvement and control purposes of either of the several plans may be lost if enforcement authority prevent improper use of these reservoirs is not adequate and adequately administered.

Paul W. McKee
Director
Maryland Water Resources Commission

APPROVED
Department of Water Resources
February 10, 1964

State of Maryland
Department of Water Resources
State Office Building
Annapolis, Maryland

STATEMENT OF OPINION REGARDING THE CORPS OF ENGINEERSI POTOMAC RIVER BASIN REPORT

The Report - Brief Summary

The Report by the Corps of Engineers presents a comprehensive plan of development of the Potomac River Basin for flood control, recreation, the development and conservation of municipal and industrial water supply, and water quality control. The plan is designed to satisfy existing needs and provide a flexible solution to future needs in the next 50 years. The Report shows an increasing need for flood control, municipal and industrial water supply, water quality control and recreation in the Potomac Basin. The most feasible and economical means of providing for these needs over the next 50 years is through a comprenensive plan utilizing major multiple - purpose reservoirs, small headwater reservoirs, local protection projects, watershed treatment and waste control measures.

The plan recommended, includes 16 major reservoirs (one at Bloomington already authorized), 418 small headwater reservoirs, three small flood control projects (all authorized under Public Law 685), and land management and conservation measures to reduce erosion and runoff.

The Report, in effect, constitutes the submission of a final plan evolved out of four preliminary basin-wide plans under consideration in 1962. One plan was subsequently eliminated (the alternative major tributary), and the remaining three were evaluated and rated as follows:

Main Stem and Upper Basin Plan	First
Upper Basin Plan	Second
Major Tributary Plan	Third

The final plan combines the first and second plans by moving the main stem dam from Riverbend to Seneca and adding four dams from the Upper Basin Plan. (North Mountain, Licking Creek, Town Creek, Tonoloway Creek). The 16 dams are described in detail in the Report. Projects 5 (Six Bridge on Monocacy above Frederick), 12 (Town Creek, near Cumberland) and 14 (Savage River Dam No. 2) are entirely within Maryland. Project 1 (Bloomington) is a joint project with West Virginia. Projects 10 (Licking Creek) and 16 (Tonoloway Creek) are close to the Maryland-Pennsylvania border, and would be joint projects between Maryland and Pennsylvania. Cost figures for all 16 projects and the division of benefits are set out in the Report.

Total estimated cost of the entire plan is $498,096 to be expended over a 50 year period. Cost of the 16 major reservoirs is $393,341,000 of which the Federal share would be $329,559,000 and the local share would be $63,782,000.

The District Engineer of the Corps of Engineers recommends that the plan formulated in the Report be adopted as the comprehensive plan for development of the water resources of the Potomac River Basin. He recommends that the projects designated as Royal Glen, Chambersburg, Staunton, Six Bridge, West Branch, Brooks Gap, Winchester and Seneca be authorized for construction for the purposes of flood control, water supply, water quality control and recreation as applicable at a total estimated cost of $248,200,000 for construction, and $3,823,000 annually for maintenance, operation, and major replacements. This recommendation is made subject to certain assurances to be given by non-federal interests, including repayments of costs for water supply, now estimated at $23,676,000 for construction and $163,000 annually for maintenance, operation and major replacements. The District Engineer also recommends that the projects in the plan designated at Licking Creek, Mount Storm, Town Creek, North Mountain, Savage II, Back Creek, and Tonoloway Creek be authorized for site preservation.

Army Board of Engineers Recommends Potomac Plan

General approval of the Potomac River Basin Plan, by the Army Board of Engineers for Rivers and Harbors has been announced by the office of the chief of Engineers.

The Board did recognize the shortage of data and the high cost involved with respect to the Seneca reservoir, and recommended that extensive studies of this be made prior to construction of the Seneca project.

Bloomington Dam - First Project of the Plan

The first project in the Corps' plan, the proposed dam on the Potomac at Bloomington, can be constructed whether the remainder of the plan is adopted or rejected. Therefore, the Congress during 1962 authorized construction of this project. The House of Representatives has appropriated funds this year in the public works appropriations bill for design of the structure and it is expected that the Senate will likewise approve the funds. There is no known objection in the State of Maryland to the construction of this dam. Its construction would have a beneficial economic effect on Western Maryland in addition to its long range effect on flood control.

Still to be resolved is the securing of local assurances of financing the non-federal benefits for the Bloomington Dam project. Discussions are being undertaken by the Corps of Engineers and the State Planning Department with the State of West Virginia and with the political subdivisions in Garrett and Allegany counties.

Maryland Consideration of the Plan

Governor Tawes designated James J. O'Donnell, State Planning Director, as coordinator of State agencies and departments and local Maryland interests, governmental and private. Mr. O'Donnell has distributed the Corps' Report to all affected State and local departments and agencies and requested their comments and opinion at the earliest possible date. He plans to hold meetings with local groups to explain the plan and secure their opinion. The replies he receives will be transmitted to the Governor who will then report the official position of the State to the Chief of the Corps of Engineers.

Department of Water Resources Comment

The Department of Water Resources wishes to limit the major portion of its comment on the Corps of Engineers' Potomac River Basin Report to the water quality and water pollution control aspects of the report.

The Corps of Engineers' Report included (1) an excellent comprehensive summary of current water problems and projected water needs for economic growth and development in the Potomac River Basin, and, (2) a recommended plan for meeting the present and projected water needs.

A. Water Supply

In view of the needs of the Potomac River Basin for water supplies, storage is the most adequate and economical solution to this problem. It would provide water for public, agricultural, and industrial needs; stabilize and increase low flows for added pollution and water quality control and provide increased recreational facilities.

B. Water Quality Improvement

The Report emphasizes that the dependable low flow in the Potomac River will not in the near future meet the needs for the many water demands and community uses along its banks; most importantly, the Nation's Capital and its surrounding urban development. When demands for water at a given location approach or exceed the minimum flow, conservation programs must be provided.

The Report points out that the quality of the water in the Potomac River will be a vital factor in any economic growth or development in the Basin. The quality of the waters of the River is affected by, and dependent on, the quality and quantity of natural flows and of the wastes and sewage discharged to it.

Waste discharges, even those that have received maximum treatment by best known methods, carry varying amounts of residual contaminants to the Potomac River, and tend to lower its water quality. Slow natural processes in the River, tend to reduce these residual contaminants, and raise the water quality. Storage of waters of the Potomac in the reservoirs, will provide longer retention time for the natural processes action and improved water quality will result.

However, the degree of water quality improvement that takes place in reservoirs is minor compared to the improvement that can be accomplished in complete sewage and waste treatment facilities. Any discharges to the River of inadequately treated waste and/or sewage will tend to minimize the effect of the natural action that takes place in the reservoirs. Continuing discharges of inadequately treated wastes will tend to cause the accumulation of organic material in the reservoirs and will tend to lead to an increasingly poor water quality condition. Such a condition will have an adverse affect on the Potomac River and might even lower the water quality significantly.

In considering the Corps' plan the Department of Water Resources wishes to stress the importance of the necessity for requiring adequate treatment for all discharges to the Potomac River. The Department wishes to emphasize that the recommended plan is not designed to be a substitute for adequate sewage and waste treatment.

The Department concurs with the Plan requirement of 80-85% pollution removal by waste treatment in the Upper Basin areas and 90% removal in the Washington Metropolitan Area prior to the construction of storage capacity for water quality. More stringent requirements than those set by the Plan might be desirable in instances, but would need to be compatible with the legislative act that governs the Department and its authority to require remedial facilities.

It is recognized that in free flowing streams, flow augmentation can be used successfully to maintain desired levels of water quality beyond that degree possible through use of the adequate waste treatment alone. It is also recognized that within certain stream reaches in the basin, such flow augmentation will be necessary and desirable in the immediate future if water quality objectives are to be realized under conditions of recorded dependable flow.

C. Recommendations

Skillful management of the reservoir system is required to realize the maximum benefits for water quality control. It is recommended that a plan be developed for co-ordinated operation, to achieve maximum benefits for all recommended uses.

It is also recommended that the early development of small headwater impoundments be undertaken; this will result in the minimum disturbance of local economy and a minimum sacrifice of high valued land. To get all the benefits possible, conservation measures should be started in headwaters where flood protection and increased flows would benefit all demands and uses within the earliest possible time.

The large reservoirs designed to protect against flood damage and provide stored water for municipal users and water quality control should be built as near as feasible to the urban centers.

With reference to water quality control and improvement, the Department of Water Resources wishes to recommend approval for the Potomac River Basin development plan proposed in the Corps of Engineers report and to recommend the following conditions:

(1) that skillful management be planned and established to maintain maximum water quality benefits from the reservoirs system as each part of the system is put into operation;

(2) that special emphasis be stressed on the fact that success of the project to improve and control water quality in the Potomac River depends on the adequate treatment of all wastes before discharge to the River;

(3) that regulations be adopted and firmly enforced by the pertinent control agency to prevent the use of reservoirs as:

a. a substitute for waste treatment facilities;

b. the principal part of any water pollution abatement or control program.

Most important, we recommend that the pertinent authority establish adequate procedures to prevent the use of these reservoirs for other than designated purposes. If this is not done, the intended improvements in water quality may well be nullified.

Maurice Siegel, Chairman
Paul W. McKee, Director

APPENDIX B

Letters from Local and Other Governmental Agencies

ALLEGANY COUNTY PLANNING & ZONING COMMISSION
Cumberland, Maryland

C
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May 23, 1964

Mr. James J. O'Donnell, Director
State of Maryland, Planning Department
301 West Preston Street
Baltimore 1, Maryland

Dear Mr. O'Donnell:

I understand that you are going to undertake a study of the Corps of Engineers proposed reservoirs. As you know the Corps of Engineers proposes two reservoirs to be located in Allegany County, which are included in all of their alternate solutions.

As I see it, the proposed reservoir on Town Creek would be a tremendous asset for Allegany County. This would provide the facility for much needed recreation and give the County a tremendous economic shot in the arm. Also this would bring a lot of new development into an area that is very sparsely inhabited now.

In any case I would be very interested in your recommendations pertaining to Allegany County and I would appreciate your keeping me informed as to your proposals and thinking pertaining to your study as it affects our County.

Yours very truly,

C. Lee Renaud /S/
Director

CLR/sah

Carroll County Planning

And Zoning Commissioners

C
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September 3, 1963

Corps of Engineers
Board of Engineers for Rivers
and Harbors
Washington 25, D. C.

Gentlemen:

For the purpose of complying with your directive concerning a public hearing scheduled on September 4, 1963 in Washington, D. C., this Board is including herein its comments concerning the proposal to construct a major reservoir at Six Bridge in Carroll and Frederick Counties (Maryland). Generally, these comments form a recommendation that the proposal of the Corps of Engineers for this facility be approved provided the following protective features, clarifications, and rights are incorporated in any final proposal for the construction of a reservoir at Six Bridge:

1. That an unlimited supply of raw water be made available without cost for the future use of Carroll County, its communities, and citizens.

2. That provisions be made for the utilization of water from the reservoir for irrigation of adjacent farm lands.

3. That the matter of the degree of treatment of sewerage disposal system, both public and private, be clarified as well as the monetary aids for providing any corrections or additions to existing public or private systems needed to meet any such requirements.

4. That clarifications be made regarding potential regulations for protection of the reservoir waters from effluent from existing and/or new farm facilities and/or lagoons from which there may be run-off.

5. That clarification be made as to the exact and type taking of land adjacent to the reservoir and its protective area as well as the restriction which may be imposed as to public access or use.

6. That clarification be made as to types of recreation, the control thereof, and the agency or agencies for which such control is to be given.

The Board of County Commissioners of Carroll County is desirous that its favorable consideration of the project be also subjected to (in addition to the above conditions) the receipt of definite answers from the Corps of Engineers prior to final submission of the proposal to Congress or any of its sub-committees, in order that Carroll County, its communities, and its citizens can give further consideration to the matter at hand.

Such action has been taken following a review of the proposal by the Corps of Engineers for the Six Bridge Reservoir after discussion with the Soil Conservation District for Carroll County and the County's Planning Commission.

Respectfully submitted,

/S/ Horace S. Brauning, President

/S/ Francis J. Crawford

/S/ Edmund L. Carr

COUNTY COMMISSIONERS OF CARROLL COUNTY (MARYLAND)

B:ns

Frederick County Planning & Zoning Commission

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May 23, 1963

The Honorable J. Millard Tawes
Governor of Maryland
Annapolis, Maryland

Dear Sir:

In the next few months the Corps of Army Engineers will present to you their proposed plans for dams on the Potomac River and its tributaries. Included are dams at Sixs Bridge and at Seneca.

President Renn, and Messrs. Dorsey and Horman of the Board of County Commissioners; Messrs. Bowlus, Munshower and Renn of the Board of Aldermen of Frederick City; Chairman Wight and Messrs. Horman and Swisher of the Planning and Zoning Commission of Frederick County; Chairman Bowers and Messrs. Brunk and Grove of the Frederick City Planning Commission; Messrs. Bloom, Cutsail, Linton, Notingham, Rosencrantz, and Whiteford, engineers and staff members of these various groups and the Frederick County Metropolitan District and Sanitary Commission met today and authorized the writer to send you this letter showing it as approved by County and City Governing Bodies and the two Planning Commissions. No actual members of the Sanitary Commission could be present so it is not approved by that group.

For the past two years most of this group have kept in touch with the engineer's plans for the Potomac River Basin. They have recently studied the latest decision of the engineers as published last February.

The unanimous convictions of these groups are as follows:

I. As the primary purpose of this project is to help the District of Columbia solve its water and sewage problems, Frederick County should not be called upon to pay anything for the construction or maintenance of dams at Sixs Bridge or at Seneca. Also loss in taxable value of real estate taken for the projects should be re-imbursed to the County.

II. While condemnation of property, to meet the needs

of water supply, may well be justified, condemnation of property for recreational purposes and to preserve wild life can not be justified. It is a bad and terrible thing to force an owner to sell his home or farm to meet some need that is not absolutely essential. At Sixs Bridge about 5000 acres of land would be condemned for water needs alone, while about 7500 acres would be condemned if recreation is included.

III. One of the four plans, in the early stages of the study, excluded a high dam near Seneca and included more dams upstream and on the tributaries of the Potomac. A plan such as the one above would be far less damaging than a plan including a dam at Seneca or River Bend on the Potomac.

Respectfully,

/S/ Daniel E. Wight, Chairman
Planning & Zoning Commission
of Frederick County

DEW:frr

P.S. The Frederick County Metropolitan District and Sanitary Commission met on May 27th and officially approved this letter.

FREDERICK NEWS-POST

June 24, 1964

"Top County Officials Hold Confab On Dams At Seneca, Six's Bridge"

The Frederick County Commissioners met for several hours on Tuesday with representatives of the County Planning Commission, State Senator John A. Derr and some of the Frederick County Delegates.

County Health Officer Dr. Forbes H. Burgess, Frederick Mayor E. Paul Magaha and Frederick City Engineer Robert A. Whiteford also attended the meeting to consider again the proposals of the Army Engineers for a high dam at Seneca and a smaller dam on the Monocacy River at Six's Bridge in Frederick County.

James O'Donnell, director of the Maryland State Planning Commission, called the meeting of county and city officials at 2 p.m. in Winchester Hall to obtain an impartial estimate of the current feelings of the local county officials on the two dams.

This must be included in a report the State Planning director has to submit to Governor J. Millard Tawes before the end of July.

Recommend From Report

Based on this report of local feelings in the various parts of Maryland, Governor Tawes will make recommendations to the Army Engineers, who created the plans for the two dams.

After considering the recommendations of Governor Tawes and the Governors of Virginia, West Virginia and Pennsylvania on their Potomac River Basin plans, the Army Engineers will make their final decisions on their proposals and submit them to Congress and the White House, a Delegate attending the meeting on Tuesday reported.

The county and city officials and state legislators discussed the Army Engineers plans for the two local area dams and pointed out that the Seneca Dam in Montgomery County would flood thousands of acres of Frederick County land along the Potomac River up to Point of Rocks.

The Six's Bridge Dam would flood or reserve for water conservation 5,850 acres of local land and reserve another 2,650 acres for recreation and wildlife preservation purposes, according to the Army Engineers plans.

The group reiterated a position they had taken almost a year ago in a letter sent to Governor Tawes by Planning Commission chairman Dan Wight on October 17, 1963 which was in favor of the Six's Bridge Dam provided the county was reimbursed for all real estate flooded or reserved for the dam and provided there was no condemnation power for merely recreational purposes, but entirely opposed to the large dam at Seneca.

June 24, 1964

8,500 Acres Affected

All of the 8,500 acres of Frederick County land affected by the Monocacy River dam at Six's Bridge would be subject to condemnation if it could not be obtained by purchase in the Army Engineers plans.

Although not opposing condemnation for water conservation purposes or the purchase of private land by the State or national governments for recreation or wildlife preservation purposes, The Frederick County officials said they were unalterably opposed to the power of condemnation being used for recreation or wildlife purposes.

They remained unalterably opposed to the large dam at Seneca in Montgomery County which would flood or reserve even more Frederick County land than the Six's Bridge Dam, an estimated 11,000 acres on the southern boundary of the county along the Potomac River.

State Senator Derr said he was opposed to all high dams on the Potomac and added that he believed that small dams along the Potomac tributaries, like the Six's Bridge Dam on the Monocacy, would serve the same purpose.

Delegate Charles E. Collins agreed with Senator Derr and said that he was definitely opposed to all high dams. Delegate Joseph Payne expressed no opinion at the meeting.

Delegate Goodloe E. Byron said he questioned the recreational value of land in the Six's Bridge area since it is flat land which would be flooded part of the time by the dam.

Commissioner A. Irvin Renn questioned if the amount of money to be offered by the Army Engineers to flooded out farm owners, based on estimates of Frederick County land values now five years old, would be nearly enough for these flooded out farmers to purchase other farm land in Frederick County at the highly inflated farm land values in the county today.

Commissioner Russell Z. Horman had no comment. Commissioner Lawrence A. Dorsey was in Woodsboro participating in the annual carnival in his home.

OFFICE

GARRETT COUNTY COMMISSIONERS

Roads Department

Oakland, Maryland

COPY

3 August 1964

James J. O'Donnell
Director of State Planning
State Office Building
301 W. Preston Street
Baltimore, Maryland 21201

Dear Mr. O'Donnell:

This letter is in response to your telephone conversation with State Senator Spencer Graham from Garrett County, on July 13, 1964 concerning the building of the Bloomington Dam.

The undersigned duly elected officials of Garrett County are unanimously in favor of this project as attested by our signatures hereto. The many advantages of the construction of this dam to be afforded this area are too apparent to be repeated here.

We do want to request at this time, however, that every consideration be given for the utilization of local employment in the construction of this dam, since chronic unemployment is one of the economic ills of Garrett County.

There will, of course, be some discussions necessary between the elected officials of Garrett County and the administrative force handling this project concerning some of the mechanics of the projects, such as replacing existing roads, etc. We feel however, that these matters can be worked out in due course.

/S/ Spencer Graham
State Senator

/S/ Elza E. Bray
Member, House of Delegates

/S/ Martha I. Glotfelty
Member, House of Delegates

/S/ Allen S. Paugh
President, Board of County Commissioners

/S/ H. D. Swartzentruber
Member, Board of County Commissioners

/S/ Earl E. Opel
Member, Board of County Commissioners

INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

Statement
regarding
U. S. Army Corps of Engineers
Potomac River Plan

The Interstate Commission on the Potomac River Basin, organized in 1940, is a joint undertaking by the States of Maryland, Pennsylvania, Virginia and West Virginia, and the District of Columbia for "The purpose of regulating, controlling, preventing, or otherwise rendering unobjectionable and harmless the pollution of the waters of said Potomac drainage area by sewage and industrial and other wastes." For this reason the remarks contained herein will be confined to the segments of the Potomac River Plan as formulated by the District Engineer, which affect or relate to water quality.

The Commission wishes to commend the District Engineer and cooperators for the vast amount of comprehensive water resource data that has been compiled and included in the Report. The data will have great permanent value and constitute a significant contribution to water resource knowledge in the Potomac River Basin.

Two official actions of the Interstate Commission on the Potomac River Basin have been cited in the Plan and deserve comment at this point.

A. Resolution adopted November 16, 1962.

> "In view of the low dependable stream flow, and in view of present and projected needs of legitimate water users, it is the judgment of this Commission that all waste waters must receive the highest physically and economically practicable degree of treatment required by such needs, before they are returned to the streams of the Potomac River Conservancy District, and that increased efforts should be made to this end." Vol I. p. 14.

B. Resolution adopted August 8, 1946.

> "Minimum Water Quality Criteria for streams in the Potomac River Basin." Vol I. p. 92.

These water quality criteria were intended as guides for the generally prevailing conditions desired for the waters of the Basin. Quoting from the minutes of the Commission meeting wherein these criteria were adopted: "It was decided that these criteria should be used as a guide for the water quality for any particular area, and were not to be considered rigid standards."

This Commission has the following comments with respect to the Plan:

(1) We agree with the Plan recommendation, Vol I. p. 41,"e. That, prior to construction, responsible non-Federal interests will give assurances satisfactory to the Secretary of the Army that they will: (1)....(2) Intend to control pollution of the streams subject to low flow augmentation by adequate treatment or other methods of controlling wastes at their sources, (3)....(4)...." Such requirements would be compatible and in conformity with the Commission objectives cited in Resolution A above.

(2) It was proper and reasonable for the District Engineer, as a guide in his calculations of the amounts of storage to be provided for water quality control, to use Class C of the criteria, referred to in Resolution B, as the "stream quality objectives to be achieved by waste treatment and flow regulation" (see Vol V. p. 13.). But the Interstate Commission constitute adoption of the Class C criteria as the "standard" for all of the waters of the Potomac Basin. The Commission believes that different minimum standards may be applicable to different portions of the Potomac and its tributaries at different times, and such minimum standards may be recommended by the Commission from time to time to the Signatories after consultation with the proper authorities of the States having jurisdiction over, and legal responsibility for the enforcement of quality "standards" for, such portions of the Potomac and its tributaries.

(3) This Commission recognizes that in free flowing streams flow augmentation can be used successfully to maintain desired levels of water quality beyond that degree possible through use of the "highest physically and economically practicable waste treatment". It also recognizes that within certain stream reaches in the basin, such flow augmentation will be necessary in the near future if water quality objectives are to be realized under conditions of recorded dependable flow.

(4) The Commission is unable to locate research data establishing that water which might be released from the proposed Seneca reservoir would sufficiently affect the quality of the river below the reservoir to justify the cost of storage for water quality control. In view of the highly complex nature of the Potomac estuary and the shortage of basic data concerning it, the Commission believes that additional information is necessary to support the high cost of improvement of conditions therein and that the Corps should review fully, in the light of then existing knowledge, alternative means of accomplishing water quality objectives in the estuary.

(5) The Commission recognizes the need for a fully co-ordinated operational plan that will permit skillful management of any proposed reservoir system and realization of maximum benefits for all purposes served, including water quality control. While the value of a detailed operational plan, considered prior to authorization, appears doubtful, the Commission supports development of such a plan in full cooperation with all interests concerned.

(6) The Commission supports the use of small headwater impoundments and believes they will be beneficial if proper flow control means are provided. Reports have been received by the Commission which imply that certain of the small projects proposed may not be economically feasible. Additional investigation of sites, and relationship of cost to benefits should be considered prior to authorization.

(7) The Commission notes that the Plan provides for development of water oriented recreational opportunities created by the major elements of the Plan. It believes, however, that in order to assure full realization of such opportunities, further consideration should be given to possible pollution problems arising from use of project land and water areas for recreational purposes. The Commission supports full consideration of this matter in master recreational plans prepared in full cooperation with all interests concerned.

(8) The Commission notes the forecasts of greatly increased domestic and industrial uses of water and is concerned by the fact that, as the District Engineer states on page 14 of his Report, "The control of stream water quality is inseparable from the quantitative water supply" because, to put it another way, "as the use of water increases the qualtiy of the unaugmented supply decreases."

The Commission hails the prospect of the establishment of facilities throughout the basin in which storage, sedimentation and dilution -- time proven allies of water quality improvement -- may operate against the increasing volume of wastes arising from population increases and technological changes.

It also hails the prospect of water conservation, which will make large volumes of relatively clean water readily available at many points throughout the basin, for industrial, domestic and other uses, including its use for the mitigation of industrial and domestic pollution, which remains in some degree after treatment in the most highly efficient waste treatment plants.

THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION

June 10, 1964

MEMORANDUM

TO: The Commission

FROM: Technical Staff

SUBJECT: Potomac River Basin Report, U. S. Army Corps of Engineers.

In response to the Congressional directive to develop a plan for flood control, recreation, water supply and water quality control, the Corps of Engineers in this report has offered complete, comprehensive proposals which are reasonable and sound according to existing methods and knowledge, and should be endorsed in principle. However, there are of course many complex and very serious problems created by the major impoundments, especially Seneca, with respect to this Region. Therefore, since the Engineer's plan is presented as a guide, great care must be taken in its implementation. In the Seneca Project, two factors must be taken into consideration and resolved before this project proceeds.

1. Consideration must be given to future developments in water and waste water treatment methods for quality control and water supply.

2. The complex nature of the Potomac estuary should be further studied because of the present uncertainty over the effectiveness of water released from this upper basin impoundment to control water quality in the upper tidal estuary of the Washington metropolitan area.

The scheduled completion date for the Seneca Project is 1977, at which time it is expected that water rationing practices would be required during periods of low flow. It is possible that rapid technological advances could, in the interim period, alter this plan in some, or in many respects. If, toward the end of this 13 year period, the proposed dam at Seneca is still considered the best possible solution, the concerned jurisdictions have no other recourse but to recommend the implementation of the Engineer's plan. Therefore, the plan should be given this qualified approval and Seneca along with some, and possibly all, of the likely dam sites should be placed under some form of control so they may be preserved for the time of future need. Existing two acre zoning should provide the necessary protection.

The recreational potential resulting from this project, if and when it comes, would be of considerable significance and concern to Montgomery County. Based on the experience in other communities, it would seem advisable, if not absolutely necessary, to protect the public interest and investment by making certain that all lands at a considerable distance inland from any future shoreline be in public ownership.

METROPOLITAN WASHINGTON
COUNCIL OF GOVERNMENTS
Regional Sanitary Advisory Board
Room 304 District Building
14th & E Streets, N. W.
Washington 4, D. C.

COPY

September 23, 1963

REPORT ON REGIONAL WATER SUPPLY

BACKGROUND

The Regional Sanitary Advisory Board of the Metropolitan Washington Council of Governments appointed an Ad-Hoc Committee on Regional Water Supply in January 1962, to consider the present and future water supply needs of the region and to determine whether there were any problems associated therewith which warranted more detailed study. The Committee membership included representation from the following political subdivisions and water supply agencies:

Charles County, Maryland
District of Columbia
Prince William County, Virginia
Corps of Engineers, U. S. Army
Fairfax County Water Authority, Virginia
Loudoun County Sanitation Authority, Virginia
Washington Suburban Sanitary Commission, Maryland

In order to obtain basic information on present and future water supply needs, the Committee prepared a "Questionnaire on Existing Water Supply and Plans for Insuring Future Adequacy" for consideration of approximately 41 major political subdivisions, authorities, commissions, federal agencies and privately-owned utilities now serving over 2,000,000 persons in approximately 630 square miles which are concerned with water supply matters in the region.

The Committee presented the results of its investigations to the Board on August 19, 1963, and after full consideration by the members, the Board adopted the following report:

FINDINGS

It is the opinion of the Board that, considering the region as a whole, the data in Table 1 suggests:

(1) that there will be a population of about 4,800,000 to be served in the year 2000, which will exert a maximum daily demand of approximately one billion gallons per day for which there is a present dependable supply of approximately 635 million gallons per day and a present treatment plan capacity of about 400 million gallons per day,

(2) that ground-water sources now provide a minor portion of the total water supply demand,

(3) that the maximum daily demand for water will exceed the dependable supply in about 1976,

(4) that the Potomac River is the logical source of the additional supply of water which will be required in future years to meet the demands of those areas which now utilize this source, as well as of those areas which will need augmentation of other existing supplies in future years,

(5) that, for water supply purposes alone, impoundment and regulation of flow of the Potomac River will be required,

(6) that the maximum daily demand for water will require an enlargement of the present treatment plant capacity within the next five years, and

(7) that additional treatment plant capacity of about 600 million gallons per day will be required to meet the needs of the year 2000.

The findings of the Board are compared with the findings of the Corps of Engineers, U. S. Army, as detailed in its recently published "Potomac River Basin Report", as follows:

	Board Year 2000	Corps of Engineers Year 2010
Population	4,793,000	4,975,600
Maximum daily demand - m.g.d.	1,011	1,235
Presently available supply - m.g.d.	635	628
Deficit in supply - m.g.d.	376	607

Aside from the larger population estimate for the later terminal period used by the Corps of Engineers (2010 vs 2000), the difference in the estimates of maximum daily demands is due primarily to a difference in assumed per capita demands. It is clear that there will be a deficit in the available supply of water unless impoundment and regulation of flow of the Potomac River is provided.

With respect to the deficit in treatment plan capacity for the future needs, it may be helpful to visualize the magnitude of this deficit in terms of the region's largest existing treatment plan facility. To meet the needs of the year 2000 plant facilities about three times as large as the existing Dalecarlia Treatment Plant will be required!

CONCLUSIONS

The Board concludes that the present use of the Potomac River as a source of water supply for a large segment of the metropolitan Washington region and the dependence of the majority of the region on this source of

water supply in future years clearly makes any problem associated therewith a regional problem. The Board further concludes that there will be problems in providing adequate water supply facilities for the region and that some of these problems require immediate consideration. Among these are:

(1) Considering presently available and probable future sources of water supply i.e., surface supplies, groundwater supplies, desalinization, etc., what are the most economical sources of water supply for the region?

(2) To what extent and at what date(s) will impoundment or regulation of flow of the Potomac River be required for water supply purposes?

(3) How should such benefits be provided and the cost thereof be allocated among the several interested political subdivisions and agencies?

(4) To what extent and at what date(s) will additional treatment plant capacity be required?

(5) What are the most economical means of providing the required additional facilities for the several segments of the region?

(6) How should additional facilities be financed and administered?

The Board believes that the nature of these problems requires the services of a qualified consultant or consultants to undertake a comprehensive study of the matter. Realizing that adequate water supply facilities are vital to the region, that the use of the Potomac River as a water supply source is the paramount use which should be made of the river and that the scope of facilities required will necessitate several years of planning, design, financing and construction before they can be made available for use, the Board urges that such a study be initiated and executed at the earliest practicable dates.

TABLE 1

REPORT OF REGIONAL SANITARY ADVISORY BOARD
WATER SUPPLY DATA - PRESENT AND FUTURE
WASHINGTON METROPOLITAN REGION

SEPTEMBER 23, 1963

Source of Supply	Population Served - 1000's			Maximum Daily Demand-M.G.D.			Present Dependable Water Supply M.G.D.	Present Treatment PPlant Capacity M.G.D.
	Present	1980	2000	Present	1980	2000		
Groundwater	50	40	40	8	7	7	7	8
Goose Creek	16	60	85	3	9	13	4	4
Occoquan Creek	185	269	242	31	50	50	50	44
Patuxent River	570	620	500	65	65	65	42	65
Potomac River	1,224	2,220	3,926	286	577	876	532	279
Total for Region	2,045	3,209	4,793	393	708	1,011	635	400

Note: The figures included above for present and future water supply demands for each of the several sources were supplied by the agencies now using these sources.

MONTGOMERY COUNTY COUNCIL
IN OPEN EXECUTIVE SESSION
AT ROCKVILLE, MARYLAND ON

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August 27, 1963

Resolution No. 5-548

Re: Potomac River Basin Report -
Proposed Blockhouse Point Dam

WHEREAS, the Plan of Development recommended in the Potomac River Basin Report as prepared by the District Engineer, U. S. Army Engineer District, Baltimore, and the Division Engineer, U. S. Army Engineer Division, North Atlantic, New York, has been referred to the Board of Engineers for Rivers and Harbors for review as required by law, and

WHEREAS, as a part of this review the Board has scheduled a Public Hearing on Wednesday, September 4, 1963, and

WHEREAS, the Board has invited comments from interested parties, now therefore

BE IT RESOLVED that the County Council for Montgomery County, Maryland herewith takes a strong position in opposition to the recommendation in the Potomac River Basin Report which calls for construction of a high level dam at Blockhouse Point (identified in the plan as Seneca project) for the reasons that it will cause to be inundated some 8,300 acres of property, not including government owned, at an assessed value exceeding $856,000; and for the further reason that the estimated costs to reconstruct and/or relocate Montgomery County roads inundated by this proposal would exceed $2,500,000.

BE IT FURTHER RESOLVED that the County Council for Montgomery County, Maryland wishes to be on record as generally opposed to any high level dam project in the area of the Potomac River, which would affect Montgomery County, and to further convey this position to the Board of Engineers for Rivers and Harbors, Councilman Hiser and the County Manager are hereby authorized to attend the public hearing referred to above and present this resolution and further represent the Montgomery County Council in this position as is necessary or desirable.

ATTEST: (s) James Michael Bailey
Clerk, County Council for Montgomery County, Maryland

THE MORNING HERALD June 26, 1964

State Agents Sound Out Local Officials

On Proposal For Potomac River Basin

In order to coordinate the state's position on the Potomac River basin proposals through reactions of officials on a local basis, state representatives met with city and county authorities here Thursday.

The present proposal calls for construction of 16 principal and 418 ancillary feeder dams within the span from 1965 to 2007. Those directly affecting Washington County are the Licking Creek dam which is number 10 on the list of authorization and expected to be built in 1987 and the Tonoloway dam which is number 16.

The Licking Creek dam is expected to cover 82,500 acre feet in storage and a total of 5,900 acres while the Tonoloway will cover 5,700 acres with 50,500 acre feet of storage.

The keystone to the entire program, the representative Maryland State Planning Department director, felt, is the large dam at Seneca which will consume 58,100 acres in Maryland and Virginia with 1,010,000 acre feet of storage.

During discussion of the relative merits of the program, Charles Greeb, Economic Development Commission chairman, told the four representatives that he felt that Washington County has been "sold down the river, no pun intended."

He explained that the Commission challenges the economic benefits that would accrue to Washington County from the proposed Seneca dam were built.

Greeb suggested that the dams either be built upstream where they would be more efficient and not use up prime farm land while being of benefit to the entire area or as an alternative, that low level dams be constructed along the course of the Potomac River itself.

The County Commissioners' spokesman, Evan Crossley, president, repeated the stand of the group that it is not in favor of a large dam downstream.

Greeb also indicated to the representatives that the EDC felt the relative worth of recreation facilities on Tonoloway and Licking Creek were higher to other counties rather than to Washington County.

Delegate Samuel Dillon disagreed with Greeb's viewpoint, saying that he felt there was a lack of recreational water facilities in the county and the trading center for Tonoloway would be Hancock, which would benefit the county.

June 26, 1964

He added, however, that one dam entirely within Washington County on the Conococheague, for example, would be of much greater value.

Dillon said that he thought the position the state should take is opposition to the dam at Seneca because of the use of valuable land. He pointed out however that in a 40 year program such as this the corps of engineers could well change the project.

Carl Johnson, Potomac Interstate Commission, agreed with Dillon saying that the engineers' reports is a guide and it is not to be construed as a specific schedule. With four states involved in the proposals circumstances could alter the entire program.

Crossley interjected at this point that if the Seneca dam were eliminated, a series of smaller dams would not only benefit the ultimate aim of the Washington, D. C., water supply but would also benefit the Maryland counties.

County Commissioners of Washington County

Hagerstown, Maryland

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June 25, 1964

Board of Engineers for Rivers and Harbors
Washington 25, D. C.

RE: Potomac River Basin Report
February, 1963

Gentlemen:

The Board of County Commissioners has authorized me to go on record for them in the matter of the subject report.

Our feeling is that no appreciable benefit is derived by Washington County by the recommended plan in flood control or in the establishment of recreational areas.

If it were feasible to locate the Conococheague Creek Dam in Washington County, we might benefit somewhat by the opportunity afforded to provide a recreational area in Washington County.

Very Truly yours,

/S/ David J. Custer
County Engineer

DJC/san

Washington County, Maryland

Economic Development Commission

C
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July 11, 1963

Board of Engineers for Rivers and Harbors
U. S. Army Corps of Engineers
Tempo C Building
2nd & Q Streets, S. W.
Washington 25, D. C.

Gentlemen:

For the purposes of the official record of your public hearing on the Potomac River Basin Report, the Washington County (Maryland) Economic Development Commission wishes to present its position on this project, unanimously adopted by the Commission on September 5, 1962, as follows:

> "The Washington County Economic Development Commission favors a program for the Potomac River Basin which would result in the development of tributary and headwater dams with the objective of maintaining a reasonably constant flow along the entire course of the river. This program should be given top priority and the major dam at Seneca should not be constructed until this program is completed and the results of the upstream dam construction can be evaluated properly."

We hope that this position will be duly entered into your records.

Sincerely,

/S/ Daniel J. Robrer
Executive Director

DJR:jr

Washington Suburban Sanitary Commission

4017 Hamilton Street

Hyattsville, Maryland 20781

C O P Y

September 5, 1963

Major General Robert G. MacDonnell, Chairman
Board of Engineers for Rivers and Harbors
Corps of Engineers, U. S. Army
Temporary Building C
2nd and Q Street, S. W.
Washington 25, D. C.

Dear Sir:

In reply to the notice of public hearing on the Potomac River Basin Report issued by the Board of Engineers for Rivers and Harbors on July 8, 1963, the Commission has directed that I advise you of its official position on this subject.

This Commission was delegated the responsibility by the General Assembly of Maryland for providing water supply, sanitary sewerage and storm drainage needs of the metropolitan area of Maryland adjacent to the District of Columbia. At the present time the Commission serves over 700,000 people in Montgomery, Prince George's and Howard Counties. It is estimated that the future growth of the area will require that these facilities be expanded to provide for a population of 1,300,000 in the year 1980 and 2,000,000 in the year 2000.

The Commission furnishes water for the area from two principal sources -- the Patuxent River and the Potomac River. During this past summer the Commission's treatment plant on the Potomac River furnished a maximum day need of fifty million gallons. Plans are being prepared now for an addition to this water treatment plant and it is expected construction will be started this fall. Upon completion of this addition, the plant will be able to treat up to 120 mgd. It is expected that the Potomac River will be required to furnish the following average and maximum water demands of the Commission's service area:

Year	Average	Maximum
1970	35 mgd	105 mgd
1980	65 mgd	170 mgd
1990	100 mgd	240 mgd
2000	150 mgd	335 mgd

After the year 2000 it is expected that the additional water supply requirements for the area of necessity will have to be obtained from the Potomac River.

Taking together the domestic water requirements of the Washington Suburban Sanitary District, the District of Columbia and Virginia it is clearly obvious that impoundment of the river will be necessary in the near future. Moreover, not only must the domestic water requirements of the area be met but also sufficient reservoir storage must be provided to control pollution and flood flows.

This Commission has spent many millions of tax and utility revenues to eliminate sewage pollution of the streams which flow through the Nation's Capital by construction of sewers connecting to the District of Columbia system. The residents of Maryland have paid their pro rata share of many of the sewers in the District of Columbia as well as their share of the construction and operating costs of the treatment plant. While most of the present sewage flow and the expected future flows will be treated at the D. C. plant, the Commission expects to start construction this year of another sewage treatment plant near the junction of the Potomac River and the Piscataway Creek beyond the Service area of the D. C. Plant. It is estimated that the future flow of treated sewage effluents reaching the Potomac River from the Washington Suburban Sanitary District will be:

Year	Average
1970	100 mgd
1980	130 mgd
1990	160 mgd
2000	190 mgd

If the water quality of the lower estuary is to be maintained at a level commensurate with the desired scenic and recreational uses of the river, then low flow augumentation through upstream reservoirs is an absolute necessity.

It is the recommendation of this Commission that the Corps of Engineers undertake multiple purpose development of the Potomac River, including the construction of the necessary reservoirs, in the most economical manner.

Very truly yours

/S/ Robert J. McLeod

Chief Engineer

AM/H

APPENDIX C

Summary of Federal Legislation Pertaining to Cost Apportionment

A divison of project costs was made between Federal and non-Federal interests. This schedule of cost sharing was based on the allocation of costs to the project purposes and on presently appliable laws and regulations governing cost sharing practices.

Costs allocated to flood control were apportioned in accordance with Section 201 of the Flood Control Act of 1958 (Public Law 85-500), which states that these costs are considered to be all Federal.

In accordance with the Water Supply Act of 1958 (Title III of Public Law 85-500), and with the Federal Water Pollution control Act Amendments of 1961 (Public Law 87-88), costs of providing water supply storage for immediate and anticipated future use are apportioned to non-Federal interests. All construction, operation and maintenance, replacement and interest costs incurred by the Federal Government and allocated to water supply are to be repaid by the water users. No interest will be charged on the investment allocated to future water supply up to a limit of 30 per cent of total project costs until use is initiated, but such interest-free period shall not exceed 10 years. No payment will be required for the cost allocated for future water supply until use is initiated except for the payment of interest charges on the unpaid balance after the interest-free period. However, all costs for future water supply, including interest incurred after the interest-free period, must be repaid within 50 years after use is initiated.

Under the provisions of the Federal Water Pollution Control Act Amendments of 1961 (Public Law 87-88), costs of water quality control features incorporated in any Federal reservoir shall be apportioned to Federal interests if the benefits therefrom are widespread or national in scope and are not in lieu of adequate treatment. It is considered that all water quality control benefits considered in this report resulting from development of the Potomac River Basin are such that the costs allocated to water quality control must be apportioned to Federal interests.

In accordance with the Flood Control Act of 1944 (Public Law 534, 78th Congress), the Flood Control Act of 1962 (Public Law 87-874) and current policies, the cost of basic recreation facilities essential for the full public utulization of the recreation resources of any water resources project including lands, access and operation and maintenance are non-reimbursable and therefore Federal cost. In accordance with present policy joint costs have been apportioned the same way if at least one-half of the entire project costs are offset by benefits other than recreation. If less than one-half of the project costs are offset by benefits other than recreation, then joint costs in excess of 25 per cent of the total project costs were apportioned to non-Federal interests.

Repayment of costs for water supply apportioned to non-Federal interests may be made by either sharing construction costs before or during project construction, plus annual payments of operation and maintenance costs and payment of replacement costs when incurred, or by annual payments for the construction costs including interest during construction and interest on the unpaid balance subject to the interest moratorium provision of the Water Supply Act of 1958 within the life of the project, but not to exceed 50 years after use is initiated, plus annual payments for operation and maintenance and payment of replacement costs when incurred. Responsible non-Federal interests must agree, prior to construction, to repay the costs for initial water supply and also must furnish reasonable assurance that they will contract for and repay the costs allocated to future water supply in accordance with the applicable provisions of the Water Supply Act of 1958 and the Federal Water Pollution Control Act Amendments of 1961. Those non-Federal interests, whose water supply requirements do not exceed the current dependable flow of the streams from which such supplies are secured, would not be required to participate in the sharing of costs until such time as their water demands exceed the current dependable flow.

For all other costs apportioned to non-Federal interests, reasonable assurances that these obligations will be assumed must be received, prior to the initiation of construction, from responsible interstate, State or local organizations financially capable of assuming the obligations. Local interests would be further required to furnish assurances that they would: intend to control pollution in the streams subject to low-flow augmentation by adequate treatment or other methods of controlling wastes at their source protect channels downstream of the reservoirs from encroachment which would adversely affect their operations; and hold and save the United States free from all water rights claims resulting from construction and operation of these reservoirs. Related programs of land and water management required for full realization of the water resource potentials of the Basin will necessitate a sustained and vigorous pursuit of such programs by both non-Federal and Federal interests. Responsible State and local orgaiizations have shown continuing interest in varying degrees in water resources development in the Potomac River Basin, but no assurances of local cooperation have been received at this time.

Extract from Potomac River Basin Report

Vol. I, pp. 121-123

APPENDIX D

WATERSHED PROTECTION AND FLOOD PREVENTION ACT, AS AMENDED*

AN ACT

To authorize the Secretary of Agriculture to cooperate with States and local agencies in the planning and carrying out of works of improvement for soil conservation, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That erosion, floodwater, and sediment damages in the watersheds of the rivers and streams of the United States, causing loss of life and damage to property, constitute a menace to the national welfare; and that it is the sense of Congress that the Federal Government should cooperate with States and their political subdivisions, soil or water conservation districts, flood prevention or control districts, and other local public agencies for the purpose of preventing such damages and of furthering the conservation, development, utilization, and disposal of water and thereby of preserving and protecting the Nation's land and water resources.

SEC. 2. For the purposes of this Act, the following terms shall mean:
The "Secretary" - the Secretary of Agriculture of the United States.
"Works of improvement" - any undertaking for--
(1) flood prevention (including structural and land-treatment measures) or
(2) the conservation, development, utilization, and disposal of water
in watershed or subwatershed areas not exceeding two hundred and fifty thousand acres and not including any single structure which provides more than five thousand acre-feet of floodwater detention capacity, and more than twenty-five thousand acre-feet of total capacity. No appropriation shall be made for any plan involving an estimated Federal contribution to construction costs in excess of $250,000, or which includes any structure which provides more than twenty-five hundred acre-feet of total capacity unless such plan has been approved by resolutions adopted by the appropriate committees of the Senate and House of Representatives: Provided, That in the case of any plan involving no single structure providing more than 4,000 acre-feet of total capacity the appropriate committees shall be the Committee on Agriculture and Forestry of the Senate and the Committee on Agriculture of the House of Representatives and in the case of any plan involving any single structure of more than 4,000 acre-feet of total capacity the appropriate committees shall be the Committee on Public Works of the Senate and the Committee on Public Works of the House of Representatives, respectively. A number of such subwatersheds when they are component parts of a larger watershed may be planned together when the local sponsoring organizations so desire.

"Local organization" - any State, political subdivision thereof, soil or water conservation district, flood prevention or control district, or combinations thereof, or any other agency having authority under State law to carry out, maintain and operate the works of improvement; or any irrigation or reservoir company, water users' association, or similar organization having such authority and not being operated for profit that may be approved by the Secretary.

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* (P. L. 566, 83d Cong., 68 Stat. 666; P. L. 1018, 84th Cong., 70 Stat. 1088; P. L. 85-624, 85th Cong., 72 Stat. 563; P. L. 85-865, 85th Cong., 72 Stat. 1605; P. L. 86-468, 86th Cong., 74 Stat. 131, 132; P. L. 86-545, 86th Cong., 74 Stat. 254; P. L. 87-170, 87th Cong., 75 Stat. 408; P. L. 87-703, 87th Cong., 76 Stat. 608.)

SEC. 3. In order to assist local organizations in preparing and carrying out plans for works of improvement, the Secretary is authorized, upon application of local organizations if such application has been submitted to, and not disapproved within 45 days by, the State agency having supervisory responsibility over programs provided for in this Act, or by the Governor if there is no State agency having such responsibility--

(1) to conduct such investigations and surveys as may be necessary to prepare plans for works of improvement;

(2) to prepare plans and estimates required for adequate engineering evaluation;

(3) to make allocations of costs to the various purposes to show the basis of such allocations and to determine whether benefits exceed costs;

(4) to cooperate and enter into agreements with and to furnish financial and other assistance to local organizations: *Provided*, That, for the land-treatment measures, the Federal assistance shall not exceed the rate of assistance for similar practices under existing national programs;

(5) to obtain the cooperation and assistance of other Federal agencies in carrying out the purposes of this section.

SEC. 4. The Secretary shall require as a condition to providing Federal assistance for the installation of works of improvement that local organizations shall--

(1) acquire, or with respect to interests in land to be acquired by condemnation provide assurances satisfactory to the Secretary that they will acquire, without cost to the Federal Government, such land, easements, or rights-of-way as will be needed in connection with works of improvement installed with Federal assistance: *Provided*, That when a local organization agrees to operate and maintain any reservoir or other area included in a plan for public fish and wildlife or recreational development, the Secretary shall be authorized to bear not to exceed one-half of the costs of (a) the land, easements, or rights-of-way acquired or to be acquired by the local organization for such reservoir or other area, and (b) minimum basic facilities needed for public health and safety, access to, and use of such reservoir or other area for such purposes: *Provided further*, That the Secretary shall be authorized to participate in recreational development in any watershed project only to the extent that the need therefor is demonstrated in accordance with standards established by him, taking into account the anticipated man-days of use of the projected recreational development and giving consideration to the availability within the region of existing water-based outdoor recreational developments: *Provided further*, That the Secretary shall be authorized to participate in not more than one recreational development in a watershed project containing less than seventy-five thousand acres, or two such developments in a project containing between seventy-five thousand and one hundred and fifty thousand acres, or three such developments in projects exceeding one hundred and fifty thousand acres: *Provided further*, That when the Secretary and a local organization have agreed that the immediate acquisition by the local organization of land, easements, or rights-of-way is advisable for the preservation of sites for works of improvement included in a plan from encroachment by residential, commercial, industrial, or other development, the Secretary shall be authorized

to advance to the local organization from funds appropriated for construction of works of improvement the amounts required for the acquisition of such land, easements or rights-of-way; and, except where such costs are to be borne by the Secretary, such advance shall be repaid by the local organization, with interest, prior to construction of the works of improvement, for credit to such construction funds.

(2) assume (a) such proportionate share, as is determined by the Secretary to be equitable in consideration of national needs and assistance authorized for similar purposes under other Federal programs, of the costs of installing any works of improvement, involving Federal assistance (excluding engineering costs) which is applicable to the agricultural phases of the conservation, development, utilization, and disposal of water or for fish and wildlife or recreational development, and (B) all of the cost of installing any portion of such works applicable to other purposes except that any part of the construction cost (including engineering costs) applicable to flood prevention and features relating thereto shall be borne by the Federal Government and paid for by the Secretary out of funds appropriated for the purposes of this Act: *Provided*, That, in addition to and without limitation on the authority of the Secretary to make loans or advancements under section 8, the Secretary may pay for any storage of water for anticipated future demands or needs for municipal or industrial water included in any reservoir structure constructed or modified under the provisions of this Act not to exceed 30 per centum of the total estimated cost of such reservoir structure where the local organization gives reasonable assurances, and there is evidence, that such demands for the use of such storage will be made within a period of time which will permit repayment of the cost of such water supply storage within the life of the reservoir structure: *Provided further*, That the local organization shall agree prior to initiation of construction or modification of any reservoir structure including such water supply storage to repay the cost of such water supply storage for anticipated future demands: *And provided further*, That the entire amount of the cost paid by the Secretary for such water supply storage for anticipated future demands shall be repaid within the life of the reservoir structure but in no event to exceed fifty years after the reservoir structure is first used for the storage of water for water supply purposes, except that (1) no repayment of the cost of such water supply storage for anticipated future demands need be made until such supply is first used, and (2) no interest shall be charged on the cost of such water supply storage for anticipated future demands until such supply is first used, but in no case shall the interest-free period exceed ten years. The interest rate used for purposes of computing the interest on the unpaid balance shall be determined in accordance with the provisions of section 8.

(3) make arrangements satisfactory to the Secretary for defraying costs of operating and maintaining such works of improvement, in accordance with regulations presented by the Secretary of Agriculture.

(4) acquire, or provide assurance that landowners or water users have acquired, such water rights, pursuant to State law, as may be needed in the installation and operation of the work of improvement.

(5) obtain agreements to carry out recommended soil conservation measures and proper farm plans from owners of not less than 50 per centum of the lands situated in the drainage area above each retention reservoir to be installed with Federal assistance; and

(6) submit a plan of repayment satisfactory to the Secretary for any loan or advancement made under the provisions of section 8.

SEC. 5. (1) At such time as the Secretary and the interested local organization have agreed on a plan for works of improvement, and the Secretary has determined that the benefits exceed the costs, and the local organization has met the requirements for participation in carrying out the works of improvement as set forth in section 4, the local organization may secure engineering and other services, including the design, preparation of contracts and specification, awarding of contracts, and supervision of construction, in connection with such works of improvement, by retaining or employing a professional engineer or engineers satisfactory to the Secretary or may request the Secretary to provide such services: Provided, That if the local organization elects to employ a professional engineer or engineers, the Secretary shall reimburse the local organization for the costs of such engineering and other services secured by the local organization as are properly chargeable to such works of improvement in an amount not to exceed the amount agreed upon in the plan for works of improvement or any modification thereof: Provided further, That the Secretary may advance such amounts as may be necessary to pay for such services, but such advances with respect to any works of improvement shall not exceed 5 per centum of the estimated installation cost of such works.

(2) Except as to the installation of works of improvement on Federal lands, the Secretary shall not construct or enter into any contract for the construction of any structure.

(3) Whenever the estimated Federal contribution to the construction cost of works of improvement in the plan for any watershed or subwatershed area shall exceed $250,000 or the works of improvement include any structure having a total capacity in excess of twenty-five hundred acre-feet, the Secretary shall transmit a copy of the plan and the justification therefor to the Congress through the President.

(4) Any plan for works of improvement involving an estimated Federal contribution to construction costs in excess of $250,000 or including any structure having a total capacity in excess of twenty-five hundred acre-feet (a) which includes reclamation or irrigation works or which affects public or other lands or wildlife under the jurisdiction of the Secretary of the Interior, (b) which includes Federal assistance for floodwater detention structures, shall be submitted to the Secretary of the Interior or the Secretary of the Army, respectively, for his views and recommendations at least thirty days prior to transmission of the plan to the Congress through the President. The views and recommendations of the Secretary of the Interior, and the Secretary of the Army, if received by the Secretary prior to the expiration of the above thirty-day period, shall accompany the plan transmitted by the Secretary to the Congress through the President.

(5) Prior to any Federal participation in the works of improvement under this Act, the President shall issue such rules and regulations as he deems necessary or desirable to carry out the purposes of this Act, and to assure the coordination of the work authorized under this Act and related work of other agencies, including the Department of the Interior and the Department of the Army.

SEC. 6. The Secretary is authorized in cooperation with other Federal and with States and local agencies to make investigations and surveys of the watersheds of rivers and other waterways as a basis for the development of coordinated programs. In areas where the programs of the Secretary of Agriculture may affect public or other lands under the jurisdiction of the Secretary of the Interior, the Secretary of the Interior is authorized to cooperate with the Secretary of Agriculture in the planning and development of works or programs for such lands.

SEC. 7. The provisions of the Act of June 22, 1936 (49 Stat. 1570), as amended and supplemented, conferring authority upon the Department of Agriculture under the direction of the Secretary of Agriculture to make preliminary examinations and surveys and to prosecute works of improvement for runoff and waterflow retardation and soil erosion prevention on the watersheds of rivers and other waterways are hereby repealed: Provided, That (a) the authority of that Department of Agriculture, under the direction of the Secretary, to prosecute the works of improvement for runoff and waterflow retardation and soil erosion prevention authorized to be carried out by the Department by the Act of December 22, 1944 (58 Stat. 887), as amended, and (b) the authority of the Secretary of Agriculture to undertake emergency measures for runoff retardation and soil erosion prevention authorized to be carried out by section 7 of the Act of June 28, 1938 (52 Stat. 1215), as amended by section 216 of the Act of May 17, 1950 (64 Stat. 163), shall not be affected by the provisions of this section: Provided further, That in connection with the eleven watershed improvement programs authorized by section 13 of the Act of December 22, 1944 (58 Stat. 887), as amended and supplemented, the Secretary of Agriculture is authorized to presecute additional works of improvement for the conservation, development, utilization, and disposal of water in accordance with the provisions of section 4 of this Act or any amendments hereafter made thereto.

SEC. 8. The Secretary is authorized to make loans or advancements (a) to local organizations to finance the local share of costs of carrying out works of improvement provided for in this Act, and (b) to State and local agencies to finance the local share of costs of carrying out works of improvement (as defined in section 2 of this Act) in connection with the eleven watershed improvement programs authorized by section 13 of the Act of December 22, 1944 (58 Stat, 887), as amended and supplemented: Provided, That the works of improvement in connection with said eleven watershed improvement programs shall be integral parts of watershed or subwatershed work plans agreed upon by the Secretary of Agriculture and the concerned State and local agencies. Such loans or advancements shall be made under contracts or agreements which will provide, under such terms and conditions as the Secretary deems appropriate, for the repayment thereof in not more than fifty years from the date when the principal benefits of the works of improvement first become available, with interest at the average rate, as determined by the Secretary of the Treasury, payable by the Treasury upon its marketable public obligations outstanding at the beginning of the fiscal year in which the loan or advancement is made, which are neither due nor callable for redemption for fifteen years from date of issue. With respect to any single plan for works of improvement, the amount of any such loan or advancement shall not exceed five million dollars.

SEC. 9. The provisions of this Act shall be applicable to Hawaii, Alaska, Puerto Rico, and the Virgin Islands.

SEC. 10. There are hereby authorized to be appropriated such sums as may be necessary to carry out the purposes of this Act, such sums to remain available until expended. No appropriation hereafter available for assisting local organizations in preparing and carrying out plans for works of improvement under the provisions of section 3 or clause (a) of section 8 of this Act shall be available for any works of improvement pursuant to this Act or otherwise in connection with the eleven watershed improvement programs authorized by section 13 of the Act of December 22, 1944 (58 Stat. 887), as amended and supplemented, or for making loans or advancements to State and local agencies as authorized by clause (b) of section 8.

SEC. 11. This Act may be cited as the "Watershed Protection and Flood Prevention Act."

SEC. 12. When the Secretary approves the furnishing of assistance to a local organization in preparing a plan for works of improvement as provided for in section 3:

(1) The Secretary shall so notify the Secretary of the Interior in order that the latter, as he desires, may make surveys and investigations and prepare a report with recommendations concerning the conservation and development of wildlife resources and participate, under arrangements satisfactory to the Secretary of Agriculture, in the preparation of a plan for works of improvement that is acceptable to the local organization and the Secretary of Agriculture.

(2) Full consideration shall be given to the recommendations contained in any such report of the Secretary of the Interior as he may submit to the Secretary of Agriculture prior to the time the local organization and the Secretary of Agriculture have agreed on a plan for works of improvement. The plan shall include such of the technically and economically feasible works of improvement for wildlife purposes recommended in the report by the Secretary of the Interior as are acceptable to, and agreed to by, the local organization and the Secretary of Agriculture, and such report of the Secretary of the Interior shall, if requested by the Secretary of the Interior, accompany the plan for works of improvement when it is submitted to the Secretary of Agriculture for approval or transmitted to the Congress through the President.

(3) The cost of making surveys and investigations and of preparing reports concerning the conservation and development of wildlife resources shall be borne by the Secretary of the Interior out of funds appropriated to his Department.

As amended September 27, 1962.

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